Controlled Waters Risk Assessment

Sladen Mill, Littleborough

SOIL AND STRUCTURES

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Report Status

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Report Number	001

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	V02 – Revised following Client comments
	V03 – Revised following peer review
	V04 – Revised with findings of additional fieldwork
	V05 – Revised following receipt of finalised environmental testing certificates
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Annexes Background Information (presented separately)

Peer review: *this Controlled Waters Risk Assessment has been developed with input from Land Quality Management's Paul Nathanial, lead author of the CIRIA guidance on PFAS and BS18504:2017 Sustainable Remediation.*

Units*: Throughout this Report chemical concentrations or target concentrations are reported in: parts per million (ppm) milligrams per kilogram (mg/kg) for solids; and, parts per billion (ppb) micrograms per litre (ug/l) for liquids.*

Appointment

Soil and Structures Ltd were instructed by Mere Development Group (*the Client*) in June 2024 to prepare a Controlled Waters Risk Assessment (*the Report*) to support the re-development of a parcel of land formerly occupied by Sladen Mill, Littleborough (*the Site*).

Development proposals include for construction of 25 no. dwellings and associated hardstanding, including access roads, and soft landscaping areas under reserved matters planning application ref. 21/00950/REM pursuant to outline permission ref. 15/0125/OUT.

Reliance on the advice presented herein rests solely with the Client.

Scope and Context

The Controlled Waters Risk Assessment (*this Report*) follows on from and builds on, previous ground-related reporting prepared by others for the Site and the proposed development. The Report has also been prepared following extended pre-application consultations with the Environment Agency the full minutes/details of which are not referenced herein but rather the basis of the agreement that was sought carried through the conclusions.

This Report presents a revised assessment of risk presented to 'Controlled Waters' (*as defined by the Water Resources Act 1991*) that asks - is the risk to identified Controlled Waters from identified sources of potentially polluting material pollution acceptably low and, if not, how can the risk be reduced to acceptably low levels?

In support of this main objective, the Report also;

> Addresses data gaps, clarifies key elements of the Site's characterisation and presents updated ground and groundwater models for the Site – the 'baseline' condition; and,

> Supports follow-on decision-making for the proposed development of the Site, advice on which is set out within Soil and Structure's Remediation Strategy (report ref. 20403-R-002-V04) – the 'endline' condition.

The legal context of the advice presented within this Report relates to an assessment of:

i) The suitability of the Site for its proposed end use that is rooted within national planning policy guidance (the National Planning Policy Framework) that is governed by planning law (various acts). The assessment of 'suitability' relates specifically to the potential hazard of pollution.

Advice in relation to the hazards of potentially harmful material ('contamination') or ground gases is excluded from this assessment but is carried across within the follow-on Remediation Strategy document.

This Report does not include advice in relation to other ground-related hazards, e.g. compressible material or slope stability, but notes that any remedial work need to be reconciled against the broader objectives and influences of all other groundwork activities.

Background to this Report

This Report is preceded by various existing ground-related reports prepared by others the findings of which are discussed within this Report. All available background data, including these reports, are annexed to this Report (included as a separate document available on request).

References

The Report has been written with reference to various sources of information. These are either appended or included as footnotes at the base of each respective page.

A glossary of abbreviations is provided within Section 10 of this Report.

1.0 The Site and Proposed Development

1.1 The Site

Location and size: The Site (the planning boundary) comprises a parcel of land approximately 1.30 ha in area located 175 m north of Halifax Road, Littleborough, Lancashire (Figure 1).

Access: The main body of the Site is accessed on foot and by vehicle via a fenced entrance in the south-eastern corner and the upper level of the Site openly accessible on foot and by vehicle midway down the eastern boundary.

Topography: is characterised by two distinct areas with general westerly and north-westerly fall in levels (within the Castle Brook valley): i) the 'main body' of the Site that lies between 165 and 174 mAOD; and, ii) the 'upper level' that is present midway along the eastern boundary of the Site that lies between 176.5 and 177 mAOD.

Utilities: Below ground utilities are expected to be present beneath the Site with evidence of overhead lines on Site.

Existing structures: At the point of issue various structures were noted on Site including: a masonry structure and electrical sub-station on the western edge of the Site; sandstone retaining walls in varied conditions along the eastern edge of the Site and locally to the bridge in the southern portion of the Site; and, localised areas of residual concrete hardstanding.

1.2 The Proposed Development

Development proposals: Development proposals (Figure 2) include for construction of 25 no. dwellings and associated hardstanding, including access roads, and soft landscaping areas.

ⓘ ***Development works and risk:*** *An appreciation of the construction processes is essential for development-related risk assessments given the groundworks stand to meaningfully alter the level of risk, e.g. unstable slopes being removed by earthworks, or unsuitable material being exposed as part of the works.*

To enable this development, the following groundworks are likely to be required, N.B. listing is outline only.

> Preparation: at the point of inspection Site clearance and preparation appears to have been partially completed with remaining works including: demolition of the remaining structures (detailed above) and excavation and off-Site disposal of soils impacted with non-native invasive plant species; and, removal of remaining hardstanding surfaces.

> Earthworks (cut and fill): Are expected to be required to suit development levels with the existing Made Ground deposits not anticipated to be suitable for re-use as a general fill in its current condition.

  Crucially in relation to this Report, filling operations (land raising) is planned across the lower portion of the Site returning temporarily exposed groundwater flows (from the spring-line) back beneath the ground surface that themselves will be captured as part of a groundwater management system planned as part of the works.

> Utility Excavations: Excavation of any drainage and other utility alignments.

> Foundations: Subject to the selected foundation solution, construction of sub-structures (foundations).

> Surfacing: Formation soft landscaping and hardstanding surfaces.

ⓘ ***Risk profile of the proposed development for 'Controlled Waters' [1]:*** *The proposed development would see a former industrial site that has been subject to multiple uses (land associated with coal mining, a woollen mill, a cotton raising and finishing mill, and more recently the manufacture of uPVC products) converted to a residential use.*

This change of use represents a shift from a land use with low sensitivity and high pollution potential (various industrial uses) to a high sensitivity and low pollution potential (residential). On this basis alone, the requirement for risk management (remedial works) would be anticipated.

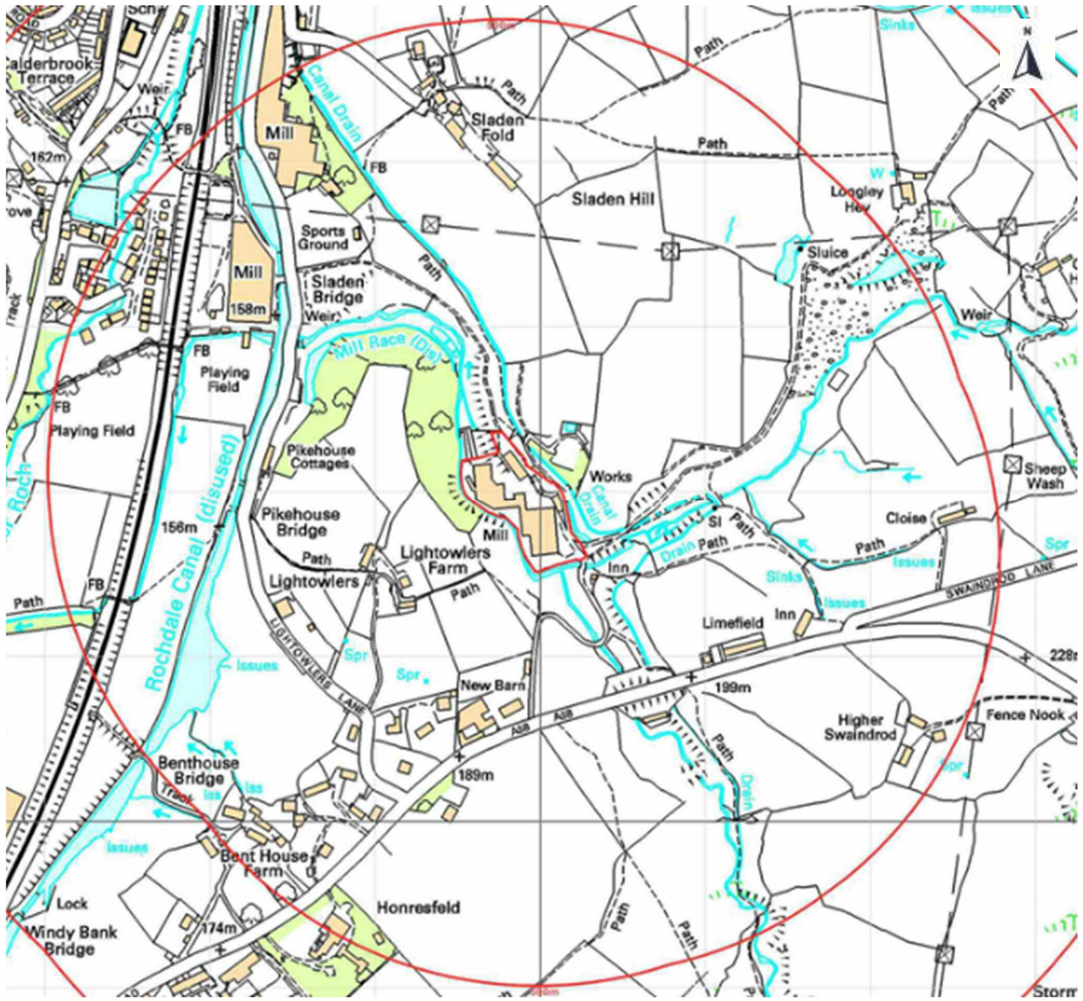


Figure 1: Location Plan

> *Site approximately centred on 394983 417383*
> *Central red line = outline planning application boundary; outer red line = 500 m buffer*

[1] *Water Resources Act 1991 (legislation.gov.uk)*

Figure 2 – Development Plan
> *Extract from appended drawing*

2.0 Background to this Report

Previous ground-related reporting: This Report follows on from multiple phases of fieldwork and various ground-related reports prepared by Brownfield Solutions Ltd and T J Booth Associates (TJBA) Ltd between April 2015 and May 2024. prepared in relation to the two planning applications (and related condition discharge applications); a reserved matters application ref. 21/00950/REM pursuant to outline permission ref. 15/0125/OUT.

An earlier ground investigation report is also understood to have been prepared as part of original transactional due-diligence however, beyond an anecdotal comment by the former owner ('the Site was found to be pretty clean overall despite its former industrial use'), this reporting has not been made available for review

Most recently, in response to Environment Agency consultation, TJBA prepared a report entitled; "*Hydrogeology and Potential Contaminant Transport*" dated May 2024 (Revision 0). In overview, this report included:

> Analytical modelling (Remedial Targets Methodology) relating to the transport of two Poly- and Per-fluoroalkyl Substances (PFAS) present within the groundwater beneath the Site to two receptors; Castle Brook (bordering the Site) and the River Roch (1.5 km west of the Site).

  Key assumptions of this model included: i) exclusion of groundwater as a 'receptor' identifying Castle Brook and the River Roch as the critical receptors; ii) defining the 'source' as the mean concentration of total PFAS (sum of PFOA and PFOS) within the centre of the Site; and, iii) use of the Drinking Water Inspectorate (DWI) threshold (0.1 µg/l) as the target concentration.

  Key findings of the analytical modelling included: i) the target concentration was not exceeded in either receptor inferring that the risk presented to the identified receptors was acceptably low. Notwithstanding this, risk management was recommended as detailed in the bullet point below.

> A recommendation that risk management (remedial works) was required to reduce the risk to Controlled Waters to acceptably low levels superseding earlier advice presented within their (TJBA) earlier reporting "*Phase 2 Site Investigation & Risk Assessment – Phase 3 Remediation Statement*" dated February 2024 (Revision 5) that no remedial works we required.

  The recommended remedial action included the provision of a 'low permeability' layer as part of the clean capping layer (recommended separately to reduce the risk to human health) to limit the rate of infiltration (rainfall) through the Made Ground deposits on Site.

A more detailed summary of these earlier reports is not included here with readers of this Report expected to either be familiar with this reporting or else have copies available for review and cross-referencing.

Sufficiency of this background information and residual uncertainty: overall, these earlier reports were considered to have generally provided sufficient factual data to: i) inform an assessment of the risk to potential receptors; and/or, ii) inform risk management decisions whilst maintaining a precautionary approach.

In a consultation response dated 14 February 2024, the Environment Agency (EA) also confirmed this position stating:

> *"We {the EA} are stratified that sufficient information has been submitted to support part (i) of condition 5."* *{Part (i) relating to the characterisation of the Site}*

Some specific points of uncertainty, or further characterisation, were identified as discussed within Section 3.0 and 4.0.

Regulatory consultations – human health: whilst not directly relating to the scope of this Report, it is noted for completeness, that within a planning decision notice (condition approval) dated 15 December 2023, Rochdale Borough Council confirmed that Condition 5 (that relates to land quality) could not be discharged subject to the Environment Agency's satisfaction that risks to Controlled Waters were either acceptably low or risk management measures, i.e. remedial works, were set out to ensure the risk would be acceptably low.

***Regulatory consultations – Controlled Waters*:** to date, nine formal consultation responses have been submitted by the Environment Agency copies of which are appended.

In addition, three in-person meetings were held as part of pre-application consultations reference to which is also made below.

The most recent of the formal consultations (07 June 2024) ultimately concluded that the relevant planning condition (Condition 5) was not able to be fully discharged (*N.B. partial discharge for 'site characterisation' was granted on 14 February 2024*) owing to:

> The conceptual site model presented not reflecting the revealed ground conditions or other environmental data that the Environment Agency have access to;

> Only two chemicals of concern being modelled as part of the Remedial Targets Methodology assessment presented as part of TJBA report *"Hydrogeology and Potential Contaminant Transport"* dated May 2024;

> Not all worksheets for the Remedial Targets Methodology being submitted;

> The incorrect selection of a target concentration noting that the Annual Average Environmental Quality Standard of 0.00065 µg/l needed to be adopted;

> The inappropriate use of averaged concentrations of PFOA and PFOS where maximum concentrations should be modelled; and,

> A general remark that; "*We {the EA} continue to feel that the site will need the benefit of remediation*".

> Specific comments drawing attention to: i) the presence of visible presence of hydrocarbons within machine excavated trial pits in select locations across the Site; and, ii) the potential presence of precursor compounds (Fluorotelemers).

Another of these recent consultations (16 September 2024) issued following the initial submission of this Report (V03) added that the relevant planning condition (Condition 5) was not able to be fully discharged owing to:

> Further investigation of the bedrock aquifer being required to determine if it should be considered 'a receptor';

> Further consideration of PFAS in soils and shallow groundwater being required;

> Insufficient sampling of PFAS in content of historic use of the Site – TOP Assay testing required;

> Use of the maximum chemical concentrations within the RTM P20 is required; and,

> Consideration of material movements across the Site with additional work (GI, RA and RS) required.

A note on the Flood Risk Activity Permit was also included but is beyond the scope of this Report.

Separately, in minutes (appended) from a meeting held on the 12 August 2024, more in-depth comments were shared that were responded to in a Briefing Note (issued separately to this Report).

The firth (V05) version of this Report consolidated findings of additional fieldwork completed in October 2024 in response to the September 2024 consultation (and respective meeting minutes).

An in-person meeting on 17 January 2025 followed the issue of V05 of this Report (minutes appended) served to further clarify the Environment Agency's requirements with respect to characterisation of the Site (the focus of the meeting with remedial options discussed in outline only).

The sixth (V06) version of the Controlled Waters Risk Assessment includes the findings of the additional fieldwork that were discussed and agreed with the Environment Agency at this latest meeting.

The most recent in-person meeting on 05 June 2025 followed the issue of V06 of this Report with the advice and presence of Paul Nathanial of LQM Ltd sought to support the discussions and establish an acceptable way forward.

This seventh (V07) version of the Controlled Waters Risk Assessment carries through the key points that were agreed upon as part of this most recent meeting that included confirmation that:

> The presence of overland flows of water across the Site have only manifest on Site because of demolition works with no overland flows of water evident prior to this work taking place. More specifically, through reductions in ground level across the eastern edge of the Site (including as part of the treatment/removal of non-native invasive species), have temporarily resulted in groundwater being exposed at the surface of the Site that, post-construction, will be below ground level. In addition, this groundwater will be captured, controlled and diverted as part of a groundwater management system further details of which are discussed within Soil and Structures Remediation Strategy, presented under separate cover.

> The use of Detailed Quantitative Risk Assessment as a tool to support the Controlled Waters Risk Assessment is not well suited to this very shallow and fast flowing groundwater catchment.

> Beyond the removal of a localised 'source' of PFAS impacted soils present on the upper level of the Site (locally to TP206), that no PFAS-related groundwater remediation will be sought by the Environment Agency.

3.0 Additional Investigation – Desk-Based Research and Testimony

3.1 Desk-Based Research

A review of the existing commentary and additional desk-based research was completed in support of this Report the findings of which included:

> ***History** - Sladen Mill v's Sladen Wood Mill:* In the 1940s when textile manufacture was rapidly moving out of the UK mill owners looked to diversify to remain financially sustainable.
>
> Within the Littleborough area, Sladen Wood Mill became a centre of excellence for research and development for new materials and finishes[2] as part of this move to diversify.

Key line of evidence: Despite sharing a similar name Sladen Wood Mill is located c. 700 m north-north-west of the Site (Figure 3) however, the presence of a canal drain between these two mills (and others within the region) does suggest a degree of connectivity. It is however noted that numerous other mills are present closer to Sladen Wood Mill that were known to have been used for the manufacture and application of plastic materials and finishes, e.g. Rock Nook Mill, that is known to have been owned and operated by a PTFE manufacturer (a PFAS compound)[1].

> ***History** - Regional Context of Sladen Mill and the Potential Use of PFAS on the Site*: The Site was formerly occupied by Sladen Mill that was historically one of many mills located within the Summit and Littleborough region (Figure 3) involved in the manufacture or treatment of textiles[3].

Key line of evidence: Sladen Mill (the Site) was later converted as a 'cotton raising and finishing' mill. Whilst the exact details of the processes involved are not known, 'raising' is a mechanical process and 'finishing' also likely to be a mechanical process in this setting given the wider context of numerous other mills within the wider area involved with the 'fulling and dyeing' of textiles (chemical dominated processes) that would have been already better set-up for the use of chemicals.

In a separate 'Heritage Note' (appended) Wardell Armstrong provided a more in-depth analysis of the Site's former uses. Of specific note is: i) the adaption of the mil in the 1960s for both the manufacture of wool products together with '*bleaching, dyeing, raising and finishing…*' over its final 20 years of operation as a mill; ii) the ownership of Wellfield Mill, further upstream of Castle Brook, by Charles Kershaw who also owned and operated Sladen Mill suggesting this was the Site where, for most of the mill's operation, fabrics were sent for chemical treatment; iii) Sladen Wood Mill (and Rook Nook Mill), that was a confirmed Site of PFAS compound use, was owned and operated by Fothergill & Harvey, local competitors to Charles Kershaw; and, iv) based on the desk-based historical review within the Heritage Note, no evidence of PFAS use can be found for Sladen Mill.

Similarly, PFAS compounds generally came into use and production from the 1940s onwards in the UK after Sladen Mill had been diversified as a 'cotton raising and finishing mill'.

In minutes from a meeting held on 12 August 2024 (appended) the Environment Agency stated: *"… This company {Alderburgh Ltd} made products … for which there is a very high confidence of using/applying finish using/containing PFAS. …"*. This statement was supported with reference to the company website[4].

Further to this comment being made in more recent consultation responses, the former owner/proprietor of the Sladen Mill complex (and owner of Alderburgh Ltd) was contacted who confirmed that: i) the main/sole process on Site was plastic (LDPE) extrusion and moulding from pellets with no liquid chemical processes; ii) sealed, liquid based waterproofing products were sourced from suppliers, stored on Site under license and sold wholesale; iii) a historic ground investigation pre-demolition 'by a Nottingham based firm' completed in support of an earlier planning application (and not available on the planning portal or company archives) found 'little to no chemicals in the ground'; and, iv) periodically ferrous (orche) water flushed down the valley via Castle Brook.

Within an in person meeting the Environment Agency shared research emerging from Australia that indicated plasticisers used in the extrusion and moulding of PE products included PFAS compounds. Whilst further interrogation of this research has not been completed, it was notionally agreed that, notwithstanding the commentary from the former owner, there was the potential for PFAS compounds to have been used on Site (as a liquid based free-product) and it remained a plausible chemical of concern.

> ***History** – Former mill race*: A former mill race (Figure 3) traverses the Site in a south to north alignment and was likely in use as a source of process water (boiler water and general water) and potentially, earlier in the Mill's use, as a source of power for a mill-wheel.

> ***Geology** – Discrepancy in the positioning of Site within the geological sequence*: The TJBA reporting positions the Site directly overlying the Woodhead Hill Rock (named sandstone unit).

This is consistent with both the 1921 geological mapping referenced in within the TJBA Coal Mining Risk Assessment (Figure 5) and the Coal Authority mapping records[5] with the latter also suggesting the presence of a geological fault through the Site (given the abrupt end of coal seam outcrops north of the Site).

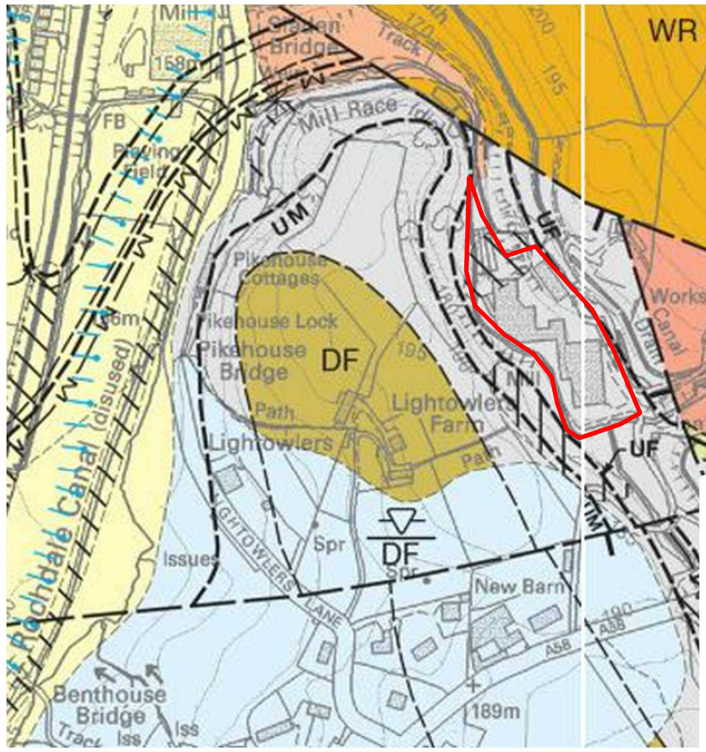
However, the most up-to-date British Geological Survey (BGS) mapping at both 1:50,000 and 1:10,000 scales (Figure 4) indicate the Site lies higher up the geological sequence with the adits to the west of the Site liekly targeting the Upper Foot Coal and not the deeper Lower Foot Coal as suggested by the contemporary mapping.

On the modern mapping (Figure 4) the fault is located further east of the Site with the Site geology characterised by undifferentiated Pennine Lower Coal Measures (which are typically a mudstone dominated sequence of rocks). This positioning of the Site is most clearly evidenced by the two outcrops of the Upper Foot Coal seam either side of the Site in Figure 3, a seam that, before being eroded away, would otherwise cross the Site following the south-westerly trending bedrock dip direction and angle (16 to 20 degrees).

The Lower Mountain Coal (also known as the Half Yard Coal[6]) and the Lower Foot Coal were both of extractable thickness and mined in the local area[7].

Based on the rotary borehole record presented within the TJBA reporting and inspection of the outcropping bedrock across the eastern embankment of the Site, the Coal Authority and earlier BGS mapping is validated. Discussions with a retired BGS Geologists noted that, unless a field report has been prepared for a given site, neither the earlier nor contemporary mapping can be relied upon as an accurate record. They also noted that digitisation of modern geological mapping can, and often does, include for gross generalisations of the geology. Correlation of the Coal Authority, earlier BGS mapping and Site observations (outcropping sandstone across embankment) is compelling evidence that the contemporary mapping is less reliable in this scenario.

[2] *Major move to plastic kept firm in credit - Manchester Evening News*
[3] *1891 Cotton Mills in Littleborough - Graces Guide*
[4] Wayback Machine
[5] *Interactive Map Viewer | Coal Authority (bgs.ac.uk)*
[6] *Todmorden Moor.pdf (wyorksgeologytrust.org)*
[7] *Rochdale district, sheet 76, a brief explanation (bgs.ac.uk)*



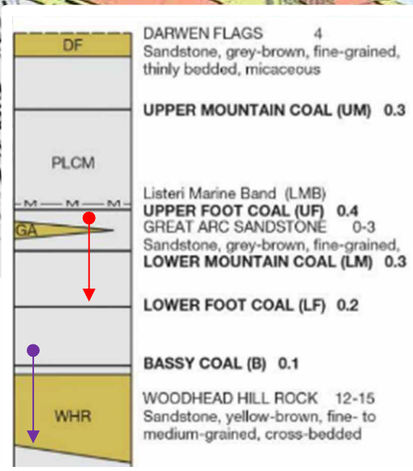


Figure 4 – Extract of current 1:10,000 solid and drift geological mapping
> Reproduced under Open Government License (v3.0)
> INSERT ➔: Vertical section illustrating c. 30 m deep borehole beneath the Site based on this mapping (red line) and c. 30 m deep borehole based on the TBJA drilling records and older geological mapping records (purple line).

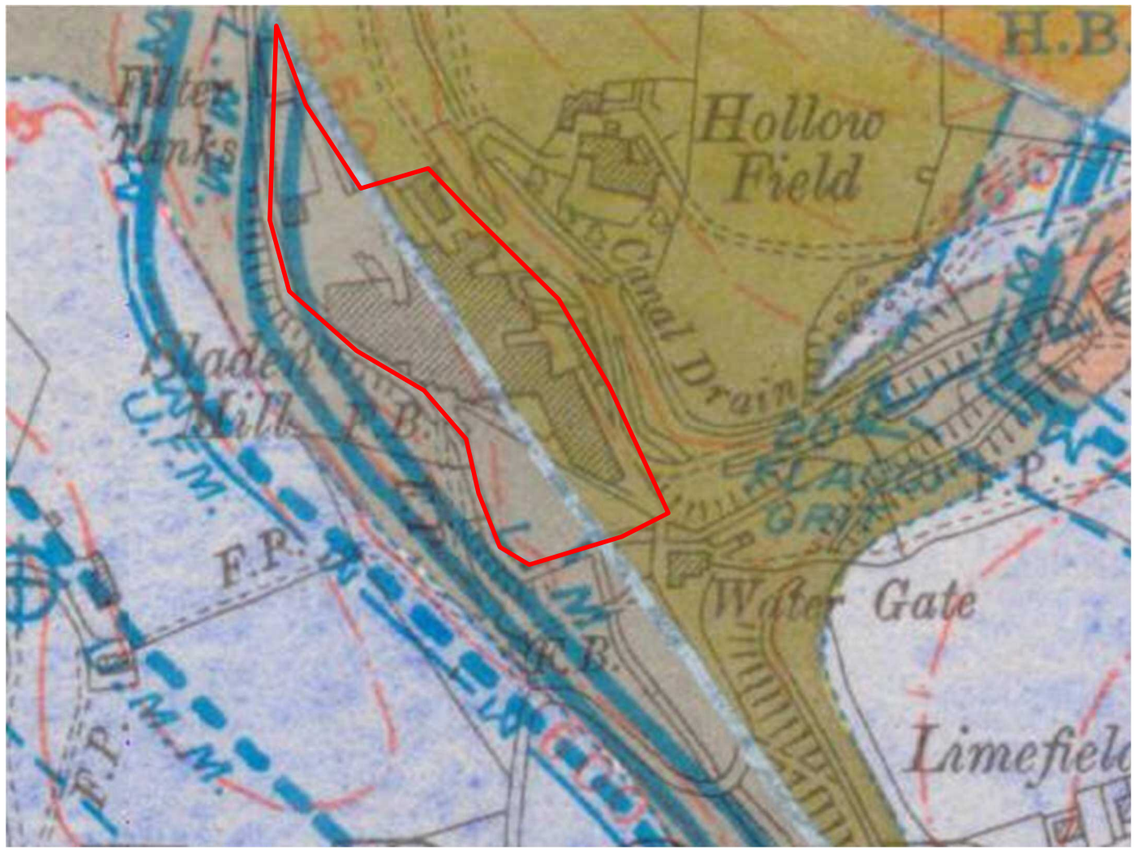


Figure 5 – 1921 1:10,560 solid geological mapping referenced within TJBA Coal Mining Risk Assessment
> Faint white line = fault alignment
> Note the difference in colour (geological units) against Figure 4
> Note the presentation of the Upper Foot coal seam (UFM – higher up the hillside) relative to the presentation within Figure 4 that suggests this was the seam the adits on the western bank of Castle Brook were targeting.

> ***Hydrogeology*** *– Spring lines*: Contemporary Ordnance Survey mapping records the presence of numerous 'spring' points at higher elevations to the Site within the same geological unit. This phenomenon is anticipated within this catchment that is dominated by highly varied topography and interbedded layers of variably permeable sedimentary rocks resulting in multi-layered aquifers (typically sandstone units).

A spring-line is evidenced at, or immediately below, the base of the embankment that runs along the eastern edge of the Site. In two discrete areas, because of the demolition works and localised reductions in ground level, e.g. removal of non-native invasive species, this has temporarily resulted in two spring points ephemerally/intermittently flowing from the base of the embankment. The intermittent nature appears to reflect seasonality (higher flows in winter/spring) and rainfall events noting that at least a 24 hr lag on rainfall events was noted.

> ***Geochemistry** – Regional Context of the Site*: As noted previously, PFAS compounds were historically used within the local area with no direct evidence of their use on the Site itself.

Key line of evidence: PFAS was detected within groundwater at a concentration of 0.0589 µg/l in a borehole located around 1000 m south-east-east of the Site[8] higher up within the local catchment and likely 'up-gradient' of the Site within the bedrock aquifer.

> ***Geochemistry** – Chemical signature of PFAS compounds*: the ratio of PFOA to PFOS can be used as a basic means to profile the chemical signature of PFAS compounds that is often an effective tool to discern whether the source is either an Aqueous Fire Fighting Foam (AFFF) or a material coating.

> AFFF has a greater ratio of PFOS to PFOA whereas material coatings have a greater ration of PFOA to PFOS.

Key line of evidence: Analysis of the ratios for the existing PFAS dataset and the additional laboratory analysis presented within this Report confirmed a consistently greater ratio of PFOA to PFOS (as illustrated on the Ground Model in Section 5.0). This confirms that the PFAS present on Site, and within the water environment locally to the Site, originates from a material coating source and not AFFF. This finding correlates with the regional context (historic centre for PFAS-related research) and the presence of various 'fulling and dying' mills within the local area, including Wellfield Mill upstream of the Site (alongside Castle Brook).

> ***Surface water quality – Roch (Source to Spodden)**:* Contemporary (2019) river quality[9] data for the local catchment - Roch (source to Spodden) - confirms a 'moderate' ecological classification.

> ***Termination depth of window sample boreholes:*** The reason the window sample boreholes typically terminated within the Made Ground deposits was not stated but assumed likely due to practical refusal on a 'hard' surface, e.g. cobble sized material or larger, or bedrock. The base depth of the window sample boreholes likely represents a point at, or close to, the bedrock surface when compared against nearby trial pits that did prove bedrock.

> ***Groundwater sampling methodology:*** Full details of the sampling methodology employed for obtaining groundwater samples was not stated but referenced to have been in line with current guidance[10].

It was subsequently confirmed via email (copy appended) that the testing guidelines issued by the laboratory were followed (correct sampling media) with the sampling methodology confirmed in outline.

Key area of uncertainty: on sampling, the boreholes likely recharged quickly due to the prevailing groundwater conditions but, given the 'shallow' flows over the bedrock surface, likely included a high proportion of sediments. Sediments will influence groundwater quality but, in this instance, due to the naturally fast recharge is expected to have contributed low levels of error within the analysis, i.e. samples likely represent groundwater quality.

> ***Sampling rationale:*** The rationale for selecting Perfluorooctanic Acid (PFOA) and Perfluoroctane Sulfonic Acid (PFOS) as markers for the broader PFAS compounds for both sampling and analytical modelling was not stated.

It is assumed that the PFOA and PFOS were selected due to their relatively higher mobility, compared to other PFAS compounds, and the fact they represent generally more toxic, regulated[11], 'dead end' daughter products from the degradation of more complex, typically less mobile, PFAS compounds. It is noted that this sampling rationale was supported by, and continued through, the additional fieldworks presented as part of this Reporting.

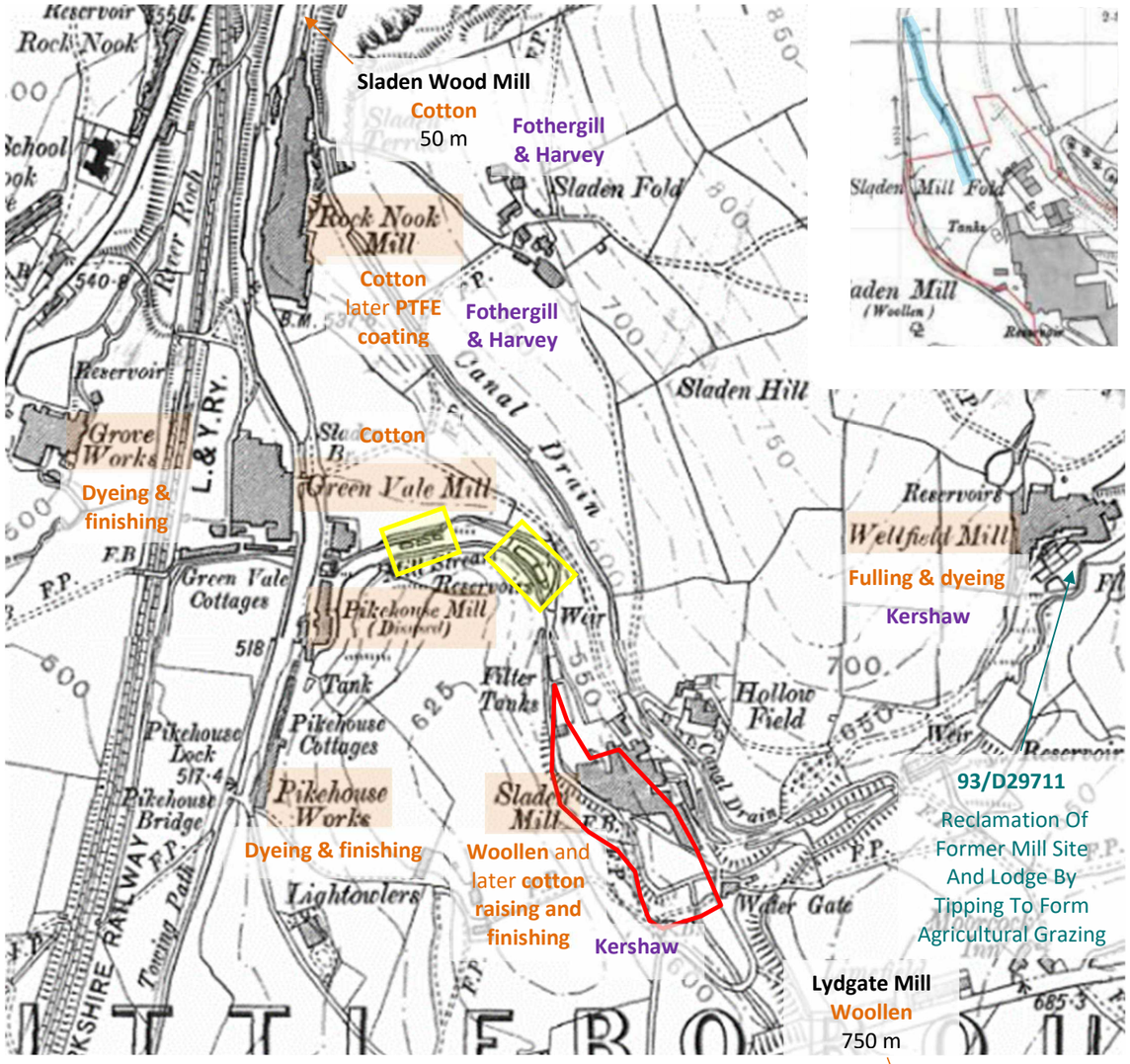


Figure 3 – Historical, industrial context of the Site
> Extract from appended mapping (1910 to 1911)
> Red line = approximate Site boundary
> Brown shaded boxes and text = most mills within the vicinity (1000 m) of the Site and their uses
> Purple text = Site ownership (where known; as presented with the appended Heritage Note)
> Yellow boxes = evidence of the watercourse having been modified to include additional downstream treatment of water remote from the upstream mills
> INSERT TOP: Extract from the 1891 Ordnance Survey mapping with the former mill race highlighted blue

[8] *PFAS / constituencies and population | Flourish*
[9] *Ecology Map | The Rivers Trust*
[10] *BS ISO 5667-11:2009 Water Quality. Sampling. Guidance On Sampling Of Groundwaters (British Standard)*
[11] The Persistent Organic Pollutants (Amendment) Regulations 2025

4.0 **Additional Investigation –** Walkover, Trial Pitting, Aquifer Testing, Monitoring, Sampling and Laboratory Analysis

The additional fieldworks were completed over four visits; 05 June 2024 (walkover and sampling), 08 July 2024 (walkover and sampling); 10 October 2024 (walkover, sampling, trial pitting), 03 February 2025 (walkover, sampling, aquifer testing and trial pitting) the rational and findings of which are summarised in the respective sections below.

As noted within Section 3.0, the scope of the additional fieldwork was developed: following a review of the existing reports prepared for the Site; to address 'data gaps'; and, with respect to the most recent round of investigation (TP301 to TP319), in direct response to requests made by the Environment Agency (meeting on 17 January 2025).

4.1 Walkover

As well as general orientation of the Site and immediate surrounding area, four separate walkovers of the Site and surrounding area were completed to investigate specific features.

> ***Former mill race:*** An extended walkover, 50 m downstream of the Site along Castle Brook was conducted to assess what evidence, if any, of the historic mill race existed (Figure 3).

Reasoning: to assess the extent to which, if any, this feature was serving as a preferential pathway for either shallow groundwater flows or surface water. On former brownfield sites with heterogenous fill deposits such as those present on the Site, relic sub-structures and particular relic culverts or drains, commonly serve as both sumps and preferential flow paths for water, and any dissolved chemicals within it, as well as any free-product, e.g. hydrocarbons.

Whilst industrial features were noted, e.g. sandstone abutment / retaining wall on the western edge of the brook and, a relic metal (likely steel) pipe projecting from the eastern (Site-side) edge of the brook, no evidence of the former mill race outlet was noted (Photograph 5 & 6).

> ***Bedrock***: Whilst already noted within the TJBA reporting, the outcropping bedrock on the embankment face within the north-eastern portion of the Site was re-inspected.

Reasoning: to further characterise the dip and interbedded nature of the sedimentary bedrock sequence beneath the Site given the structural geology of the bedrock will be having a guiding influence on both the movement of groundwater beneath the Site and within the wider catchment.

The bedrock was found to comprise a very thinly bedded fine-grained sandstone interbedded with rare thinly to thickly laminated siltstone and mudstone bands dipping at apparent angles of between 17 to 25 degrees (bed slippage likely exaggerating the upper limit) that is consistent with the recorded dip angles (Section 2.0).

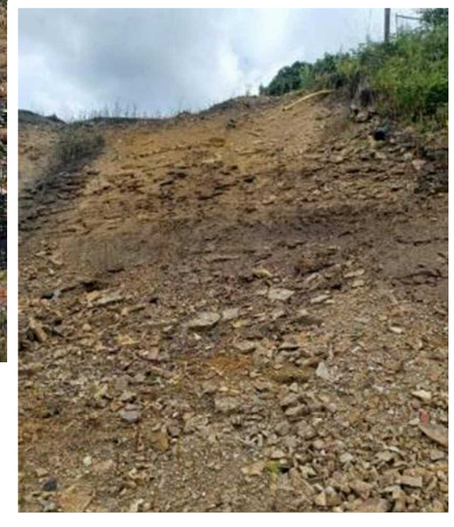
Based on the nature and thickness of this sandstone dominated sequence of bedrock, this is considered likely to represent the outcrop of the Woodhead Hill Rock that further supports the geological modelling set out within the TJBA reporting.

> ***Ephemeral/intermittent springs***: Whilst already noted within the TJBA reporting, the presence of ephemeral/intermittent spring points were identified as key features of the Site's groundwater regime. The emergence of water from these points was only apparent on completion of the demolition works that included the removal and off-Site disposal of soils impacted with non-native invasive species.

Reasoning: to further characterise these water features that are considered likely to represent points at which the groundwater temporarily surface emerges 'out of the ground' (springs) that, together with the structural geology, will have a guiding influence on the groundwater regime across the Site.

Inspection of the springs occurred on three separate occasions following wet (05 June 2024), dry (08 July 2024), wet (10 October 2024) and dry (03 February 2025) spells in the local weather (48 hrs prior to visit) noting that water flow rates drop off markedly following periods of dry weather (flashy groundwater conditions).

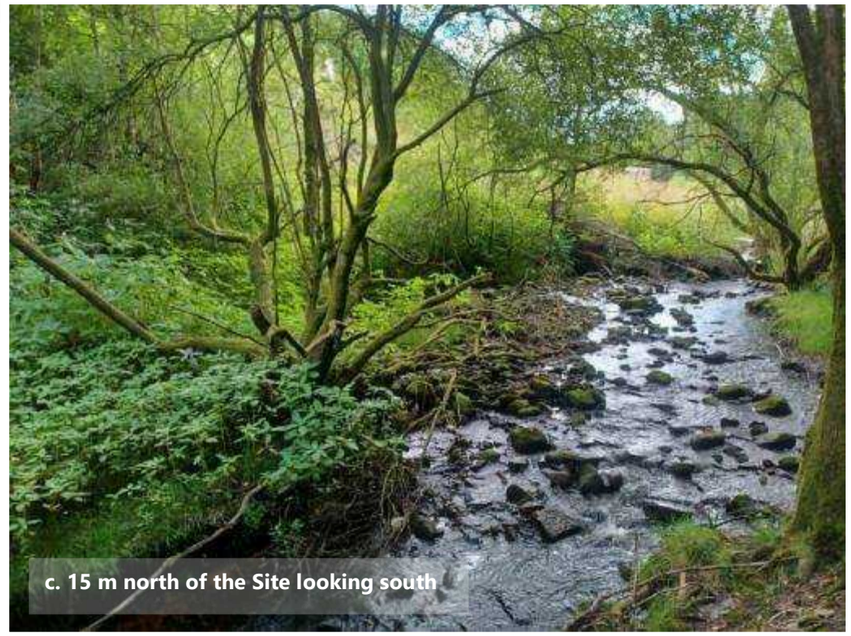
> ***Springs outside of the Site boundary:*** An extended walkover, 100 m downstream and 100 m upstream of the Site along Castle Brook was conducted to better understand the groundwater regime within the local catchment and obtain both spring water and surface water samples upstream and downstream from the Site. The importance of this work was highlighted following an initial review of the Site setting and the detection of PFAS within the spring water on the eastern edge of the Site.



Photograph 1 ↑ & 2 → Inspection of the exposed outcrop of bedrock within the north-western portion of the Site.
> *Sandstone dominated sequence of rocks*

Photograph 3 ↑ & 4 → Inspection of 'Spring 1' exposed following demolition works (flowing in wet period – Photograph 3 – positive flow within informal channel; and a dry period – Photograph 4 – minor flows from engineered gap within the wall construction indicating this spring point has been present since the wall's construction c. 1890s.

Photograph 5 ↑ & 6 → Inspection of Castle Brook downstream of the Site with no evidence of a former mill race outlet noting the presence of a pipe emerging from the direction of the Site (dry pipe and no evidence of erosion at the base suggesting limited to no discharge during wetter periods of weather).



4.2 **Trial Pitting –** First Round (TP201 to TP206)

To obtain soil samples and for ground profiling around select features on the Site, machine excavated trial pits were advanced using a 36 tonne excavator with a toothed bucket.

The exploratory hole logs are appended that include detailed descriptions of the materials encountered, key observations and photographs of the excavations and their arisings. The rational for locations is set out in Section 4.6.

The trial pitting confirmed the ground conditions reported within the existing ground investigation reporting (prepared by TJBA) with the following additional, key observations.

- *Observation 1:* the presence of rounded cobbles and boulders at the interface between the Made Ground and underlying bedrock is consistent with water-washed debris (alluvial/fluvial deposits) including within TP203 (eastern portion of the lower level). This in turn is consistent with a formerly (geological time scale) wider and faster flowing (more energetic) valley formation that was able to weather and transport particles of this size. This material was deposited on the plateau that Sladen Mill was ultimately constructed on. As flows diminished in the post-glacial period, the valley has narrowed and confined to the deep-cut channels of the respective brooks.

  The presence of these cobbles and boulders was confirmed within three (TP202, TP203 and TP204) of the trial pits advanced across the lower portion of the Site and, taken together with the nature of the material logged in these locations and the materials logged within the existing trial pits, it is likely that a terrace/plateau of post-glacial, fluvially modified soil exists over the Site that would have formed a 'plateau' of material that was well suited (topographically and geologically) to being developed for Sladen Mill. Given groundwater was observed flowing through these deposits in all locations they were encountered, they are anticipated (based on their particle size distribution and effective porosity) and evidenced to have high permeability.
- *Observation 2:* suspected evidence of breccia (fault weathered material) was encountered within TP202 (more weathered bedrock deposits that appeared 'blended' but were not reworked) located on the western edge of the Site (adjacent to Castle Brook).

  This suggests the fault's alignment is well correlated with the alignment of Castle Brook and Lydgate Brook.
- *Observation 3:* where encountered, the mudstone deposits were found to be 'weak to medium strong' that suggests a similar strength profile to the sandstone deposits (thinly bedded).
- *Observation 4:* groundwater was encountered as lateral, base flows (east to west) within all exploratory holes advanced across the lower portion of the Site.

  This trend of groundwater flow was captured on videos that can be made available on request and confirms the general trend in groundwater flow patterns: emergence of groundwater at the spring line (c. 170 mAOD) that subsequently; 'cascades' (flows into) the variably but typically high permeability (granular dominated) Made Ground deposits before intercepting the comparatively low permeability and moderately dipping (towards Castle Brook) bedrock deposits, and running off this surface into Castle Brook (supporting base flow in this watercourse);
- *Observation 5:* apart from ash and clinker, no evidence of potentially harmful or polluting material, e.g. stained soils or water, was observed within the trial pits.
- *Observation 6:* the former reservoir on the upper portion of the Site is infilled with reworked natural materials.

4.3 **Trial Pitting –** Second Round (TP301 to TP319)

To obtain additional soil samples for PFAS analysis, additional machine excavated trial pits were advanced using a 36 tonne excavator with a toothed bucket.

The exploratory hole logs are summarised in the table presented within Section 4.8 based on generalised detailed descriptions of the materials encountered alongside key observations with photographs of the excavations and their arisings included as an appendix to this Report. The rational for locations is set out in Section 4.6.

The trial pitting confirmed the ground conditions reported within the existing ground investigation reporting (prepared by TJBA), and first round of additional trial pitting with the following additional, key observations.

- *Observation 1:* the presence of rounded cobbles and boulders at the interface between the Made Ground and underlying bedrock was confirmed across the lower portion of the Site.
- *Observation 2:* a generally 'shallow' bedrock surface (within 2.0 m of ground level) was revealed across the upper portion of the Site including locally to the former reservoir suggesting this historic feature was 'shallow' and likely with a localised deepening around former drainage infrastructure.
- *Observation 3:* groundwater was encountered as lateral, base flows (east to west) within all exploratory holes advanced across the lower portion of the Site. No groundwater was encountered across the upper portion.

4.4 **Aquifer Testing**

To obtain a better understanding of groundwater flow rates across the Site, aquifer testing was completed on 03 February 2025.

The aquifer testing included a tracer test (fluorescein) within borehole M3 (Photograph 10) and falling head tests (variable head tests) within boreholes; M3, M6 and M9.

The tracer test was conducted in line with current guidance[12],[13] using 10 litres of fluorescein solution (230 g in 10 litres of tap water) with an anticipated 'break-out' time of around 1 to 3 hours based on an estimated mass, hydraulic conductivity (k) of between 10^{-2} to 10^{-4} m/s.

The tracer test was considered ineffectual with dilution anticipated to be too great resulting in too great a dilution to be visibly detected – no evidence of break-out was noted within 5 hours of dye injection.

The falling head tests involved charging selected boreholes with 50 litres (borehole M3) and 25 litres (borehole M6 and M9) of tap water and observing/measuring the head response. In each location, none of the boreholes were able to maintain a head of water with the rate of drainage (permeability) too great.

The testing confirmed 'high' rates of permeability across the three areas of the Site where testing was performed with the 'ineffectual' variable head testing indicating that permeability is likely to be 'at least' 10^{-4} m/s or faster.

This rate is consistent with both the granular dominated Made Ground deposits (anticipated to have variable but generally high permeability) and the underlying 'cobble bed' (likely localised River Terrace Deposits; anticipated to have high permeability) encountered across the Site, within which groundwater is expected to be preferentially flowing.

[12] Microsoft Word - SC030155SR8 Final.doc

[13] Tracer tests and remediation schemes: environmental permit exemption - GOV.UK

4.5 Monitoring

To obtain a better understanding of groundwater trends across the Site, groundwater level monitoring within existing monitoring wells (boreholes that were locatable and accessible) was undertaken.

Monitoring was completed on two occasions: 05 June 2024; and, 08 July 2024 with the consolidated results (including earlier monitoring completed by TJBA) presented in Table 1.

Repeat monitoring of groundwater levels was not completed on 10 October 2024 given a sufficient information was deemed to have been obtained to gain a good-enough understanding of the groundwater dynamics on Site.

***Access*:** was possible to all areas of the Site where boreholes were drilled however, some borehole positions were not able to be located or had been destroyed and the emergence of pioneer vegetation over the two visits (despite having coordinates available) meant repeat monitoring of all standpipe locations was not possible.

Pollution control and cross-contamination prevention procedures: were employed during the works that included wiping down of the dip tape with a disposable wipe.

***Revealed groundwater trends*:** The additional monitoring on Site confirmed the anticipated conditions with four key observations.

> *Observation 1:* no staining or odour was noted on the dip tape within any of the exploratory holes monitored.

> *Observation 2*: groundwater levels were generally recorded in line with those recorded as part of the previous fieldwork completed by TJBA.

  Whilst river levels are only estimated based on projections from the topographical survey, there appears to be a general trend of:

  i) Seasonality with groundwater levels highs typically occurring in Autumn/Winter and groundwater lows typically occurring in Summer.

  ii) Groundwater levels being higher than the brook across the southern two thirds of the Site.

  iii) Groundwater levels that rest close to the level of the brook across the northern third of the Site. This trend suggests that the surface watercourse (Castle Brook) is likely a gaining watercourse along most of its alignment as it passes the Site with possible losses or mixing with groundwater across the northern third of the Site.

> *Observation 3*: on the second visit, following a dry period, groundwater levels were consistently lower across the Site indicating, as anticipated, that groundwater levels are likely very sensitive to rainfall events that can be described as 'flashy'; and,

> *Observation 4*: localised variance in groundwater levels, e.g. 3 m level difference between M3 and M5 that are c. 25 m apart, taken together with the findings of the machine excavated trial pits (typically advanced deeper than the monitoring boreholes with variable strikes) is indicative of variable permeability (that is anticipated) whereby locally deeper, more granular deposits are potentially acting as 'sumps' serving to temporarily store more water.

Whilst the monitoring standpipes didn't prove bedrock deposits categorically the base / refusal depths are typically consistent with the depths of fill within nearby machine excavated trial pits. It is however noted that fill depths of over 4.00 m were recorded in various areas of the Site (refer to Ground Model in Section 5.0).

Table 1 – Consolidated Groundwater Level Monitoring Results

> *Dark blue monitoring wells (M7, M12 and M13) were advanced across the upper level of the Site*

				22.08.23				18.10.2023				07.11.2023				05.06.2024				08.07.2024				Range in levels		
				Autumn				Autumn				Winter				Summer				Summer				Cell colours = seasons		
	GL	Response Zone		Water level		Base of well		Water level		Base of well		Water level		Base of well		Water level		Base of well		Water level		Base of well		Water level		
	mAOD	*Depth range*	*Geology*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	*mbgl*	*mAOD*	Low	High	Range
M1	170.75	1.00 to 2.40	MG	0.40	170.35	2.80	167.95					0.05	170.70	2.80	167.95	0.70	170.05	1.05	169.70			1.05	169.70	0.70	0.05	0.65
M2	168.50	1.00 to 3.00	MG	1.80	166.70	3.00	165.50					1.46	167.04	3.00	167.75									1.80	1.46	0.34
M3	168.75	1.00 to 3.00	MG	1.54	167.21	3.00	165.75					1.80	166.95	3.00	165.75	2.55	166.20	3.00	165.75	2.65	166.10	3.00	165.75	2.65	1.54	1.11
M4	167.50	1.00 to 2.70	MG	2.11	165.39	2.70	164.80					1.90	165.60	2.70	166.05	2.35	165.15	2.40	165.10			2.40	165.10	2.35	1.90	0.45
M5	167.50	1.00 to 4.00	MG	2.66	164.84	4.00	163.50							4.00	163.50	2.50	165.00	3.40	164.10	2.66	164.84	3.40	164.10	2.66	2.50	0.16
M6	167.50	1.00 to 4.00	MG	2.62	164.88	4.00	163.50					2.32	165.18	4.00	163.50	2.65	164.85	3.25	164.25	2.72	164.78	3.25	164.25	2.72	2.32	0.40
M7	176.75	1.00 to 2.80	MG into Nat	Dry		2.80	173.95					Dry		2.80	164.70									Dry	Dry	
M8	168.70	1.00 to 2.00	MG	1.57	167.13	2.00	166.70					Flood		2.00	174.75									1.57	0.00	1.57
M9	172.75	1.00 to 2.40	MG					1.71	171.04	2.40	170.35	0.34	172.41	2.40	166.30	Dry		1.95	170.80	Dry		1.95	170.80	1.95	0.34	1.61
M10	170.75	1.00 to 2.00	MG into Nat					0.65	170.10	3.00	167.75	0.59	170.16	2.00	170.75					Dry		1.05	169.70	0.65	Dry	0.65
M11	168.65	0.40 to 1.40	MG into Nat					1.30	167.35	1.40	167.25	Dry		1.40	169.35	Dry		1.40	167.25	Dry		1.40	167.25	Dry	1.30	1.30
M12	178.25	1.00 to 4.00	MG into Nat					Dry		4.00	174.25	Dry		4.00	164.65									Dry	Dry	
M13	176.50	1.00 to 4.00	MG into Nat					Dry		4.00	172.50	Dry		4.00	174.25									Dry	Dry	
M14	165.00	1.00 to 4.00	MG					2.28	162.72	4.00	161.00	2.30	162.70	3.00	173.50							3.20	161.80	2.30	2.28	0.02

4.6 Surface Water Sampling

First sampling visit – 05 June 2024: To obtain a better understanding of the chemical quality of the surface water course (Castle Brook) running along the length of the Site, a key Controlled Water receptor, repeat sampling from the existing sampling positions was completed.

Second sampling visit – 08 July 2024: A return sampling visit was completed with additional sampling points selected within the local water network. Sampling of the on Site spring was also completed as discussed within Section 4.4 below.

These additional sampling points included:

i) Discrete locations > 8 m upstream from the confluence of Lydgate (or Red) Brook and Castle Brook to establish if and where there was a difference in the chemical quality across the two watercourses (*Note: TJBA reporting completed sampling upstream in Castle Brook*); and,

ii) At least 25 m downstream of the Site (Photograph 5) to establish if surface water quality further downstream followed a similar trend to that expressed by the samples obtained at the upstream, midstream and downstream sampling locations.

Sampling from the midstream sampling location was excluded given two rounds of sampling and laboratory analysis at this location revealed a predictable and repeatable trend of PFAS concentrations remaining within the upstream and downstream concentrations.

Third sampling visit – 10 October 2024: Sampling of Castle Brook was also completed on 10 October 2024 at a location around 75 m upstream of the Site (and the access bridge). The sample point was immediately downstream of a spring point on the edge of the watercourse.

Repeat sampling of other surface water monitoring locations was not completed given a good enough understanding of the surface water quality trends had already been established.

Fourth sampling visit – 03 February 2025: Repeat sampling of Castle Brook 75 m upstream of the Site was completed at the same sampling location used on the 10 September 2024.

Sampling protocol: On the first, second and fourth sampling events, surface water was collected direct from the mid-point of the channel using PFAS suitable sampling media with samples held in cool boxes chilled to below 4°C.

On the third sampling event, the surface water was collected direct from the mid-point of the channel using PET containers that, under previous analysis, had been deemed suitable for PFAS but, through changes to the analytical method and miscommunication with the testing laboratory (confirmation was sought from a separate testing laboratory within the company, that confirmed PET containers were suitable).

With respect to the use of PET containers, the laboratory was unable to confirm whether PFAS concentrations would be over or under-reported. As before, the samples held within cool boxes chilled to below 4°C.

4.7 Groundwater Sampling

Following the initial Site visit and surface water sampling on 05 June 2024, the presence of the spring points on the eastern edge of the Site were earmarked for sampling to better understand how the quality of the water emerging from these locations fed into the Site's surface water and groundwater regime.

Following the first round of spring water sampling (08 July 2024; only Spring 1 was flowing enough to sample) an additional round of spring water sampling was completed (10 October 2024) where sampling from two on-Site springs (Spring 1 and Spring 2) was completed with sampling also conducted from a third spring that discharges into Castle Brook ~75 m downstream of the Site (Spring 3).

No further sampling of the groundwater from the existing monitoring wells was completed given the sufficiency of the existing dataset (confirming the presence of PFAS in groundwater beneath the Site), together with the findings of the spring water analysis on and off Site, to inform an assessment of the fate and transport of PFAS.

Additional sampling of spring water was completed on 03 February 2025 at the third spring (Spring 3) and at the fourth spring (Spring 4) 75 m upstream of the Site. The inclusion of sampling from Spring 4 was to further investigate concentrations of PFAS within the bedrock aquifer up-gradient (hydraulic gradient) of the Site.

ⓘ ***Spring line:*** *It is important to note that, the selection 'spring' sampling locations was based on both; the viability of obtaining samples (safety, flow rate) and their location (either on Site – Spring 1 and Spring 2 – or sufficiently far from the Site to not be hydraulically connected – Spring 3 and Spring 4). However, the emergence of groundwater from the ground around this elevation (within all trial pits excavated along the embankment base) is continuous and representative of a 'spring line'. The more discrete emergence of groundwater at these 'spring' points is likely due to the presence of more permeable zones, e.g. fissures, (secondary porosity expecting to be dominating within this aquifer).*

This spring line has, in parts of the Site (locally to the 'spring points') been temporarily exposed as part of the demolition works and, once construction works are completed, will be recovered as part of land raising works as well as captured within a groundwater management system (toe-drain) that outfalls to Castle Brook under a Discharge Consent (to be agreed).

4.8 Soil Sampling

First sampling visit – 10 October 2024: Further to the soil sampling completed as part of the existing ground investigation, additional machine excavated trial pits were advanced across the Site to facilitate sampling of soils in select locations as detailed below.

The sampling was completed to better understand the fate and transport of PFAS and, more specifically with respect to this scenario, if and where the Site soils represented a source of PFAS.

Sampling protocol: In advance of the sampling commencing, a field blank was placed in the central portion of the Site, later collected and sealed on completion of the sampling. During the sampling visit the weather was generally dry with a light hail shower towards the end of the day with evidence of hail having landed in the field blank.

The use of a 36 tonne excavator permitted soil samples to be obtained directly from the bucket at the required depth intervals, limiting the potential for cross-contamination (if obtained from the spoil heap).

Samples were obtained within sampling media provided by the analytical laboratory.

Sampling locations: are explained below:

Sampling location	Feature Targeted	Rationale
TP201	Former filter beds (lower portion of the Site) – where historic wastes may have been deposited	Samples from the shallow (1.50 m depth; recently worked) and deeper (3.00 m depth; historic) **Made Ground** were obtained to confirm the presence/absence of PFAS compounds within these two materials

TP202	Borehole M4 – where the highest concentrations of PFOA were recorded within groundwater	Samples from the shallow (1.50 m depth; historic) **Made Ground** and deeper (2.00 m depth) **natural bedrock** deposits were obtained to confirm the presence/absence of PFAS compounds within these two materials. *Deeper sample test result not returned by analytical laboratory.*
TP203	Base of the eastern embankment where spring water is emerging	Samples from the shallow (0.75 m depth) **natural bedrock** deposits were obtained to confirm the presence/absence of PFAS compounds within this material
TP204	Former reservoir (lower portion of the Site) – where historic wastes may have been deposited	Samples from the shallow (1.50 m depth; historic) **Made Ground** and deeper (2.50 m depth) **natural bedrock** deposits were obtained to confirm the presence/absence of PFAS compounds within these two materials
TP205	Background concentrations on upper level – no feature targeted	Samples from the shallow (1.00 m depth; historic) **Made Ground** and deeper (2.20 m depth) **natural bedrock** deposits were obtained to confirm the presence/absence of PFAS compounds within these two materials
TP206	Former reservoir (upper portion of the Site) – where historic wastes may have been deposited and directly above 'Spring 1'	Samples from the shallow (1.00 m depth; historic) **Made Ground** and deeper (2.60 m depth) **suspected natural bedrock** deposits were obtained to confirm the presence/absence of PFAS compounds within these two materials

Second sampling visit – 03 February 2025: Following the first round of trial pitting and sampling detailed above, additional machine excavated trial pits were advanced across the Site to facilitate further sampling of soils.

The sampling was completed at the request of the Environment Agency to offer further confidence in relation to the potential presence of PFAS across the Site with low concentrations (27.5 µg/kg) of PFOA detected within TP206.

Sampling protocol: A total of 39 additional soil samples were obtained from 19 machine excavated trial pits (TP301 to TP319) at varying depth intervals in a broadly spatial, systematic pattern across the upper and lower portions of Site.

Sample depth intervals aimed to reflect a Cartesian sampling arrangement with intermediary depths across trial pit locations offering as close to a 3D spatial coverage of the soils across the Site.

Where sample depths were repeated across adjacent trial pit locations, e.g. TP301 and TP302, the layer thicknesses of the material within the ground guided sampling at the same depth intervals with a concurrent objective of characterising the chemical quality (with respect to PFAS) of the different materials encountered across the Site (noting the soils across the Site are themselves spatially variable).

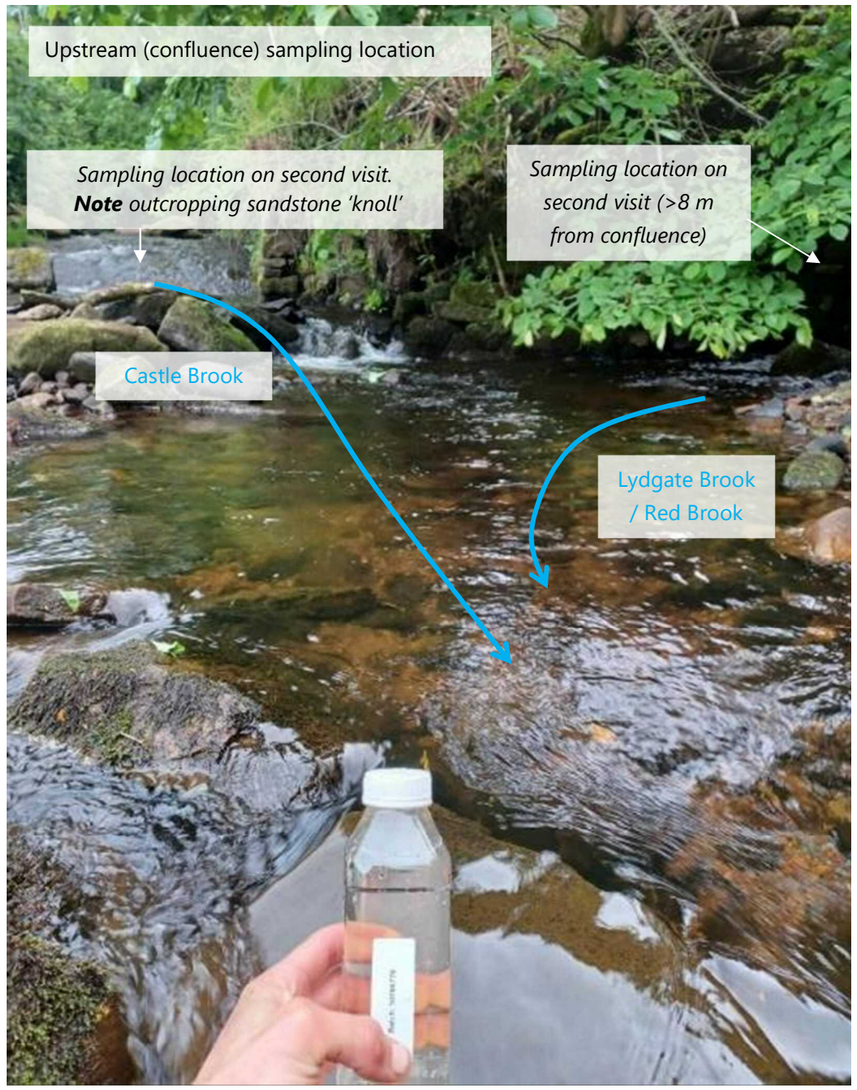
Specific targeting was included within the sampling strategy including: i) the upper level of the Site (TP301 to TP308) that lies topographically above the spring line along the eastern boundary of the Site; ii) 'delineation of TP206 (TP301 to TP303) where PFOA was detected as part of the previous round of soil sampling and analysis; iii) the former mill race (TP310); and, iv) locations in close proximity to the main, surface water flowpaths for the spring water (TP313 and TP316). No sampling below groundwater was encountered due to the confirmed presence of PFAS.

The repeat use of a 36 tonne excavator permitted a continuity in the sampling procedure from the previous round of fieldworks.

Samples were obtained within sampling media provided by the analytical laboratory and stored below 4°C until collected by the laboratory.

Sampling depths, materials sampled and locations: are detailed below and mapped on the Ground Model (page 25):

Sampling Location	Depth (m)	Material Sampled	PFAS (µg/kg)
TP301 *Upper reservoir*	0.50	Dark purplish brown ashy BRICK FILL	5.1 PFOS
	1.00	Dark greyish brown REWORKED NATURAL FILL	ND
	2.00	Silty sandy gravel RESIDUAL SOIL	ND
TP302 *Upper reservoir*	0.25	Dark grey ASH FILL	6.8 PFOA
	1.00	Multi-coloured very sandy silt REWORKED NATURAL FILL	ND
	1.50	Silty sandy gravel RESIDUAL SOIL	ND
TP303 *Upper reservoir*	0.25	Dark purplish brown ashy BRICK FILL	30.1 PFOA
	1.00	Dark grey ASH FILL	2.7 PFOA
	1.50	Silty sandy gravel RESIDUAL SOIL	ND
TP304	0.75	Dark greyish brown ashy BRICK FILL	1.4 PFOA
	1.50	Silty sandy gravel RESIDUAL SOIL	1.2 PFOA
TP305	0.50	Brown SANDSTONE and BRICK FILL	1.5 PFOA
	1.10	Silty sandy gravel RESIDUAL SOIL	ND
TP306	0.25	Dark grey ASH FILL	ND
	0.75	Silty sandy gravel RESIDUAL SOIL	ND
TP307	0.25	Dark grey ASH FILL	1.5 PFOS
	0.50	Silty sandy gravel RESIDUAL SOIL	ND
TP308	0.25	Dark greyish brown ashy BRICK FILL	2.1 PFOS
	0.50	Silty sandy gravel RESIDUAL SOIL	1.4 PFOA
TP309	0.50	Brown SANDSTONE and BRICK FILL	ND
	1.50	Brown SANDSTONE and BRICK FILL	ND
TP310 *Mill race*	0.25	Light yellowish brown SANDSTONE FILL	ND
	1.00	Light yellowish brown SANDSTONE FILL	ND
	2.00	Dark greyish brown ashy BRICK FILL	ND
TP311	-	No sample obtained; shallow groundwater encountered	-
TP312	0.50	Light yellowish brown SANDSTONE FILL	ND
	1.00	Dark greyish brown ashy BRICK FILL + ceramics	2.2 PFOA
	1.20	Dark greyish brown ashy BRICK FILL + metal fragments	ND
TP313 *Spring water pathway*	0.25	Dark greyish brown ashy BRICK FILL	4.6 PFOA
	0.75	Dark greyish brown ashy BRICK FILL	1.4 PFOA
TP314	0.50	Light yellowish brown REWORKED SANDSTONE	ND
TP315	0.50	Light yellowish brown REWORKED SANDSTONE	ND
TP316 *Spring water pathway*	0.50	Dark grey ASH FILL	2.7 PFOA
	1.00	Dark greyish brown ashy BRICK FILL	ND
TP317	0.25	Dark greyish brown ashy BRICK FILL	ND
TP318	0.30	Orangish brown cobbles REWORKED RIVER TERRACE	1.8 PFOS
	0.60	Light brown gravelly cobbles RIVER TERRACE DEPOSITS	ND
	0.90	Light brown gravelly cobbles RIVER TERRACE DEPOSITS	1.6 PFOS; 1.2 PFOA
TP319	0.50	Brown silt FILL	9.7 PFOA
	1.00	Brown silt FILL	ND

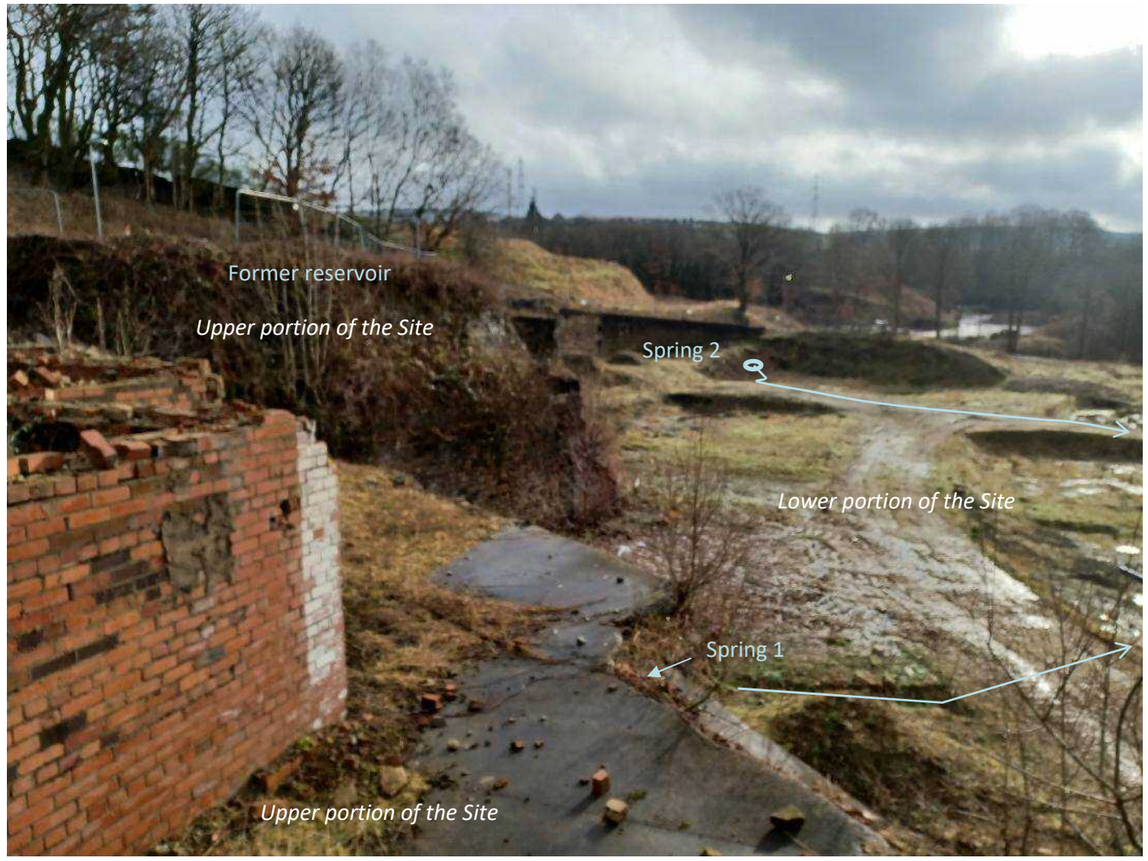


Photograph 7 ← Confluence sampling location with discrete sampling within each watercourse also completed.

Photograph 8 ↑ Field blanks for TOP Assay samples – hail drops evident on the post-sampling pot.

Photograph 9 → Spring 3 sampling location – water is flowing at a fast rate and low volume off the roof of this small opening (natural) in the stream sidewall. Castle Brook is flowing 1 m behind the photographer.

Photograph 10 Fluorescein dye tracer testing within M3 (03 February 2025)



Photograph 11 General arrangement of the Site with relative position of springs and reservoir illustrated

Photograph 12 General arrangement of the upper portion of the Site illustrating outcropping sandstone

4.9 Laboratory Analysis – First and Second Rounds of Additional Analysis – 05 June 2024 & 08 July 2024

Environmental samples (surface water and 'spring water') were obtained from the locations detailed within Section 4.4, Section 4.5, Figure 8 and the Ground Model – Plan in Section 5.0.

Sample collection by a UKAS accredited laboratory was scheduled for the following morning (within 12 hrs) to limit the potential for sampling error, e.g. degradation of sample through microbial activity.

The samples were scheduled for the same suite of analysis adopted by TJBA within their existing monitoring programmes to support an assessment of temporal variation in the chemical concentrations.

First round of surface water sampling: The analysis suites selected for testing on the first round of monitoring included:

Sulphate as SO_4	USEPA16 PAH	PFOS and PFOA

Whilst the rationale for the selection of these compounds was not stated within earlier ground-related reporting, it is inferred that the selection was because:

i) These compounds were markers of inorganic (sulphate), organic (PAHs) and emerging (PFAS) pollutants.

ii) These compounds were recorded elevated against the respective threshold concentrations as part of the groundwater monitoring completed on the Site, i.e. there appears to be a 'source' of the respective compounds within the groundwater beneath the Site that stands to present an unacceptable risk to surface water (the receptor) for which monitoring of chemical quality is warranted.

Second round of surface water sampling and spring water (groundwater) sampling: The analysis suites selected for testing on the second round of sampling included:

PFOS and PFOA

Whilst not the only chemical of concern, PFOS and PFOA were selected for repeat sampling given:

i) The comparatively elevated concentrations of these compounds recorded within groundwater beneath the Site (PFOA; 0.61 µg/l) relative to the Environment Agency's stated target concentrations (Annual Average Environmental Quality Standard; 0.00065 µg/l).

ii) The emerged trend of sulphate and PAH fate and transport with the comparatively high concentrations recorded within the groundwater beneath the Site (maximum concentrations of 473,000 µg/l and 0.09 µg/l for sulphate and benzo(a)pyrene {as a marker of PAHs} respectively) not appearing to be carried across into the surface water (maximum concentrations of 7,300 µg/l and <0.01 µg/l for sulphate and benzo(a)pyrene {as a marker of PAHs} respectively).

iii) To allow temporal trends in this key chemical of concern to be better understood.

Sulphate was excluded from the testing schedule given concentrations on the first found of monitoring indicated a possible, marginal increase in concentration downstream but were in line with those concentrations recorded during earlier visits.

Similarly, PAHs were excluded from the testing schedule given non-detectable concentrations (Method Detection Limit of 0.01 µg/l) were recorded across all three sampling locations. Again, this was consistent with the findings of the earlier sampling completed by TJBA and therefore considered to offer a more representative impression of PAH concentrations within the surface water course.

Key findings from this these first and second rounds of additional laboratory analysis included:

> A repeated trend of below detection levels of PAHs across the upstream, midstream and downstream samples.

> A repeated trend of generally 'stable' concentrations of sulphate across the upstream, midstream and downstream samples.

> A repeated trend of generally 'stable' concentrations of PFAS across the upstream, midstream and downstream samples during the first sampling visit (noting that previous reporting reported a decrease in concentrations whereas this additional sampling suggests a slight increase).

> Markedly different concentrations of PFAS compounds within Castle Brook comparted to Lydgate Brook / Red Brook suggesting the former is more heavily impacted by PFAS compounds upstream of the Site.

> A repeated trend of 'background' concentrations of PFAS within surface water upstream of the Site being up to 61 times higher than the Annual Average Environmental Quality Standard (0.00065 µg/l).

> Markedly elevated concentrations of PFAS compounds within the spring water emerging on the eastern boundary of the Site (two times higher than the average concentration within the groundwater on Site).

> A repeated trend of 'stable' concentrations of PFAS across the upstream, midstream and downstream samples during the second sampling visit noting concentrations of PFAS upstream were twenty times higher and further downstream ten times higher. These 'spiked' concentrations of PFAS upstream and downstream of the Site are likely due to the Site effectively 'buffering' (dilution with rainwater recharge) the PFAS concentrations in the spring water that, upstream and downstream of the Site, is discharging directly into the watercourse.

These findings are presented within Figure 8 and represented on the Ground Model within Section 6.0.

Further commentary on these findings is included within the Risk Assessment (Section 6.0).

4.10 Laboratory Analysis – Third Round of Monitoring – 10 October 2024

Environmental samples (soil, surface water and 'spring water') were obtained from the locations detailed within Section 4.4, Section 4.6, Figure 8 and the Ground Model – Plan in Section 5.0.

Sample collection by a UKAS accredited laboratory was scheduled for the following morning (within 12 hrs) to limit the potential for sampling error, e.g. degradation of sample through microbial activity.

The samples were scheduled for PFAS specific analysis with the testing for monohydric phenols scheduled following sampling and collection as a 'quick check' on phenol contents. It is noted that the sampling media (PET bottles) was not suited to phenol analysis and therefore the results (all below detection) may not be representative.

The soil sampling: The compounds selected for testing of all soil samples obtained as part of this round of trial pitting fieldworks (TP201 to TP206) included:

Total Oxidisable Precursor (TOP) Assay

This suite of analysis was selected to both screen the soils sampled (Made Ground and natural bedrock) for the presence or absence of PFAS (pre-oxidation) and, where present, to support forensic analysis of the source, or sources, of PFAS, e.g. does spring water PFAS originate from the same precursor as any PFAS encountered within the soil.

Third round of surface water sampling: The analysis suites selected for testing on the third round of monitoring (Castle Brook 75 m upstream of the Site) included:

PFAS DWI 47

This suite of analysis was selected to better understand the wider composition of PFAS compounds within Castle Brook, building on the analysis of PFOA and PFOS completed on the previous rounds of monitoring.

The spring water (groundwater) sampling: The compounds selected for testing of the soils on Site included:

Spring 1 (on-Site) >>>	Total Oxidisable Precursor (TOP) Assay
Spring 2 (on-Site) and Spring 3 (off-Site) >>>	PFAS Drinking Water Inspectorate (DWI) 47

The TOP Assay analysis was selected on Spring 1 given the confirmed presence of PFOA and PFOS within the water and to support forensic analysis of the source or sources of PFAS. To date, the data from this analysis has not been supplied however, based on the other lines of evidence, is not considered critical to the overall understanding of the fate and transport of PFAS.

The extended DWI 47 suite of analysis was selected to better understand the wider composition of PFAS compounds within the spring waters, building on the dataset obtained as part of previous rounds of monitoring.

Key findings from this this third round of additional laboratory analysis included:

> A single detection of PFAS within the soils (Made Ground and natural bedrock deposits; 11 samples in total) in sampling locations where PFAS, if present, was more likely to be encountered. This single detection related to the shallow Made Ground deposits within TP206 (0.50 m sample depth) on the upper level of the Site (the location of the former reservoir) where PFOA was recorded at 27.5 µg/kg.

> Highest PFOA concentrations confirmed within 'Spring 2' located on the eastern edge of the Site confirming a second location (after Spring 1) where PFAS impacted groundwater is draining onto, and into, the Site.

> Markedly higher concentrations of PFOA upstream of the Site within Castle Brook (0.097 µg/l compared to a previous 'high' of 0.044 µg/l) suggesting a factor 2 dilution of PFOA concentrations down Castle Brook. This finding needs to be viewed in the context of otherwise 'stable' concentrations of PFOA within Castle Brook as it flows alongside the Site and the subsequent increase in PFOA concentrations further downstream of the Site.

  Based on the overall trend in groundwater flow patterns in this catchment, this finding is suggestive of the soils present across the Site acting as a 'buffer' to otherwise higher concentrations of PFOA directly discharging into Castle Brook where the watercourse is bordered by rock outcrops and spring flows. It is likely that groundwater emerging from the spring-line on the Site's eastern embankment is draining into the Made Ground and natural soils across the Site and being diluted by effective rainfall falling across this area (retardation likely minimal).

  The correlation between the spring water flow paths (Ground Model – Plan; Section 5.0) and the higher concentrations of PFOA within the groundwater (borehole M4) further supports this analysis.

> Elevated concentrations of PFOA within Spring 3 (0.24 µg/l) that is sufficiently far from the Site to not be hydraulically connected further confirming the presence of elevated concentrations of 'ambient' PFAS within the bedrock aquifer higher up the hydraulic gradient. This finding offers an additional line of evidence that the primary, identifiable 'source' of PFAS lies off-Site and, based on the groundwater regime, at higher topographical elevations to the Site.

  For completeness, it is noted that, in having become impacted by the PFAS containing spring water the groundwater beneath the Site has itself become impacted and therefore, in strict terms, becomes a 'source' of PFAS.

  It is however, considered more useful to consider the groundwater beneath the Site as a continuation of the spring water flows (from Spring 1 and Spring 2 but more significantly, from a continuous spring-line along the full eastern boundary of the Site) that are both: i) draining overland across the Site where flow rates are greatest (Spring 1 and Spring 2) within silt-laden channels; and, ii) draining to ground on the eastern boundary of the Site (where the water table emerges at the ground surface) percolating through the variably but generally high permeability Made Ground and natural soil deposits, and the flowing over the bedrock surface before discharging into Castle Brook. These principles are conceptually illustrated in Figure 8.

  These flows were known about at the point in time when Sladen Mill was constructed with 'weep holes' constructed into the retaining wall that runs along part of the eastern edge of the Site. In having been temporarily exposed as part of the demolition works but no evidence of drainage infrastructure reported, it is likely that these flows were previously 'buried' beneath the Site directly into Castle Brook; pathways that, if present, have subsequently been destroyed through the action of demolishing Sladen Mill. Equally, this water may have been allowed to simply 'soakaway' and drain to ground when Sladen Mill was constructed.

These findings are presented within Figure 8 and represented on the Ground Model within Section 5.0.

Further commentary on these findings is included within the Risk Assessment (Section 6.0).

4.11 **Laboratory Analysis –** Fourth Round of Monitoring – 03 February 2025

Environmental samples (soil, surface water and 'spring water') were obtained from the locations detailed within Section 4.4, Section 4.6 (including table of results), Figure 8 and the Ground Model – Plan in Section 5.0.

Sample collection by a UKAS accredited laboratory was scheduled for the following morning (within 12 hrs) to limit the potential for sampling error, e.g. degradation of sample through microbial activity.

The samples were scheduled for PFAS specific analysis based on the Environment Agency's specific request for further confidence in relation to the potential presence of PFAS in soils across the Site.

The soil sampling: The compounds selected for testing of all soil samples obtained as part of this round of trial pitting (TP301 to TP319) included:

Total Oxidisable Precursor (TOP) Assay	PFAS Standard Suite 17

This suite of analysis was selected to both screen the soils sampled (Made Ground, natural soils and natural bedrock) for the presence or absence of PFAS with TOP Assay analysis scheduled on randomly selected but spatially distributed samples from the Made Ground.

Fourth round of surface water sampling: The analysis suite selected for testing of Castle Brook 75 m upstream of the Site included:

PFAS Standard Suite 17

This suite of analysis was selected to obtain additional confidence in the upstream concentrations of PFAS and as a comparison against the spring water quality (discharging into the water course at this point).

The spring water (groundwater) sampling: The compounds selected for testing of the soils on Site included:

Spring 3 (75 m downstream) >>>	PFAS Standard Suite 17
Spring 4 (75 m upstream) >>>	PFAS Standard Suite 17

Key findings from this this fourth round of additional laboratory analysis included:

> The detection of PFAS within 17 of the 39 soil samples scheduled for analysis noting that, any samples obtained from the lower portion of the Site stand to have been compromised by PFAS impacted groundwater / spring water flows (7 out of the total 17 positive detections of PFAS) that periodically 'flood' large areas of the Site.

> Across these 17 positive detections, only PFOA (12) and PFOS (5) were detected (of the 17 PFAS compounds tested for) emphasising that main chemical of concern is PFOA.

> Across the total 50 soil samples tested for PFAS, PFAS has been detected within 18 samples (36 %) or, 11 samples (22 %) when removing the data relating to the lower portion of the Site that, as noted above, stand to have been compromised by PFAS impacted spring water infiltrating through the Site's soils.

> With respect to the Site soils being impacted by PFAS impacted spring water, TP313 and TP316 were positioned close to main surface water flow paths for the spring water. As anticipated, PFOA was detected in both these locations suggesting that periodically higher flow rates from the two main spring points on Site are likely leading to localised flooding of these area with PFAS impacted spring water that in turn is resulting in residual concentrations remaining in the soils locally to these hole positions.

> Across the total 18 positive detections of PFAS the following statistics are reported (all values in µg/kg):

	PFOA	PFOS
Average	1.89	0.24
Max	30.10	5.10
Min	0.00	0.00
Stdev	5.85	0.85
StErr	0.83	0.12
UCL 95	3.55	0.24
LCL 95	1.89	0.24

> When excluding the comparatively higher concentrations of PFAS recorded within TP206 and TP303 (treating this area as a localised 'hotspot'), the following statistics are reported (all values in µg/kg):

	PFOA	PFOS
Average	0.77	0.25
Max	9.70	5.10
Min	0.00	1.00
Stdev	1.87	0.87
StErr	0.27	0.13
UCL 95	1.31	0.25
LCL 95	0.77	0.25

> Across all PFAS soil data, the concentrations are 'low' and, whilst strictly representing a 'source' of potential pollution, based on these overall low concentrations and overall trend of reducing concentrations with depth (Figure 6) and the low concentrations (overall mass of PFAS) relative to the groundwater concentrations.

> Considering TP206 and TP303 in isolation, where the highest concentrations of PFOA in soils was recorded on Site, these detections were recorded across shallow depths only with no PFAS detected within the deeper samples in these locations. Furthermore, at the concentrations recorded they are, of themselves, 'low' (overall mass of PFAS) and are not considered credible sources of the elevated concentrations of PFAS within either the spring water or groundwater beneath the Site.

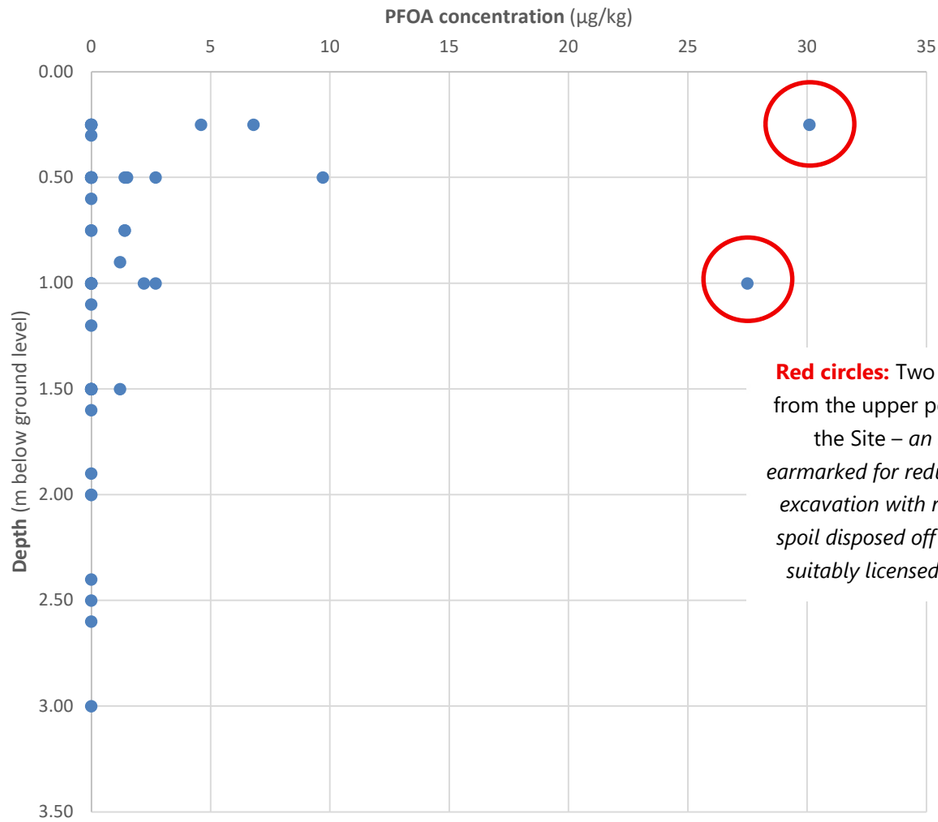
> Elevated concentrations of PFAS (mainly PFOA but also including other compounds) upstream of the Site within Castle Brook as previously recorded in October 2024

> Elevated concentrations of PFOA within Spring 3 (0.24 µg/l) and Spring 4 (0.10 µg/l) that is sufficiently far from the Site to not be hydraulically connected further confirming the presence of elevated concentrations of PFAS up-gradient of the Site within the bedrock aquifer. The confirmed presence of PFAS within Spring 4 offers an additional line of evidence that the primary, identifiable 'source' of PFAS lies off-Site and, based on the local catchment dynamics and groundwater regime, at higher topographical elevations to the Site.

> Overall, these findings are anticipated, with the presence of PFAS within the soils across the Site consistent with the high levels within the wider water catchment (lower level of the Site) and, across the upper level of the Site, potentially linked to a small volume of historically deposited PFAS containing material (locally to TP206 and TP303), e.g. hydraulic oil containing PFAS.

These findings are represented on the Ground Models within Section 5.0.

Further commentary on these findings is included within the Risk Assessment (Section 6.0).



Red circles: Two samples from the upper portion of the Site – *an area earmarked for reduced level excavation with resultant spoil disposed off Site to a suitably licensed facility*

Figure 6: Aggregated PFOA dataset (N = 50; soil data) illustrating general trend of reducing concentrations with depth

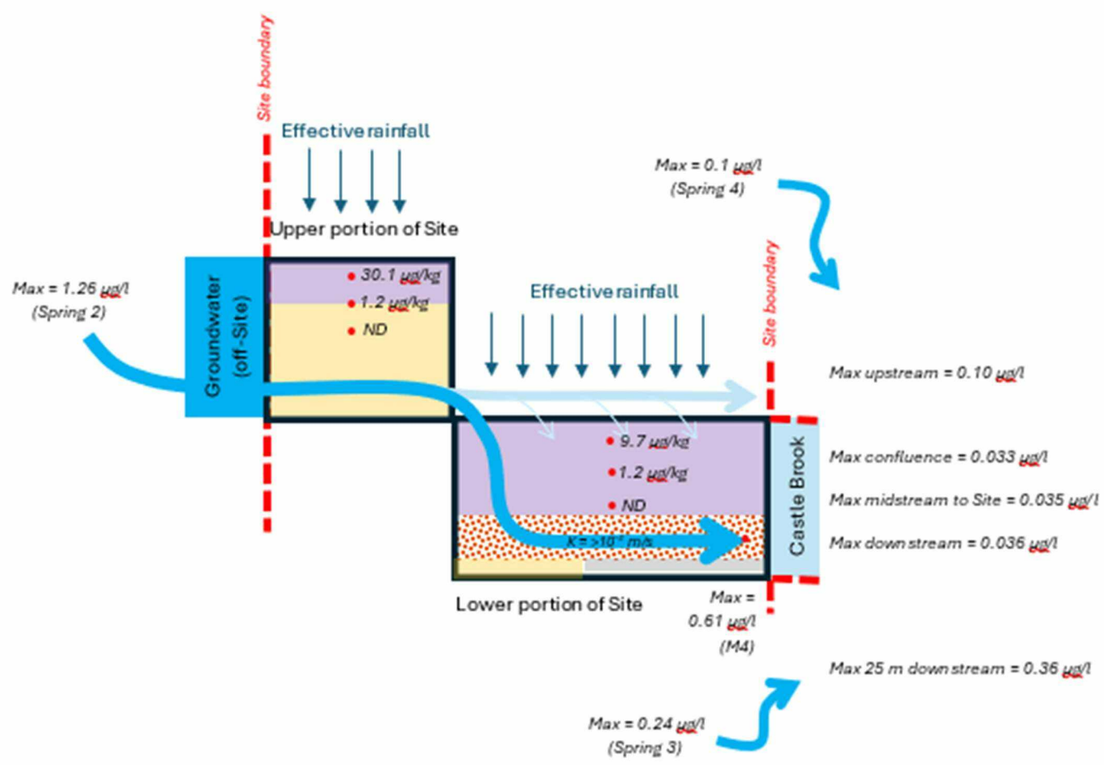


Figure 7: Compartmental model illustrating the mass flux of water through the Site where line thicknesses represent relative fluxes through the system

Sampling events (colour coordinated with graph) >		20 July 2023				05 June 2024				08 July 2024				10 October 2024			
		PFOA	**PFOS**	*Total*	*Ratio*	**PFOA**	**PFOS**	*Total*	*Ratio*	**PFOA**	**PFOS**	*Total*	*Ratio*	**PFOA**	**PFOS**	*Total*	*Ratio*
Upstream (125m; Castle Brook)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.097	0.004	0.1010	4.12
Upstream (Castle Brook)	*WS7*	0.0291	0.0013	0.0304	4.47	-	-	-	-	0.044	0.00072	0.0447	1.64	-	-	-	-
Upstream (Lydgate Brook / Red Brook)	-	-	-	-	-	-	-	-	-	0.0144	0.00081	0.0152	5.63	-	-	-	-
Upstream (Confluence)	*WS6*	0.0306	0.0013	0.0319	4.25	0.0327	0.00081	**0.0335**	2.48	-	-	-	-	-	-	-	-
Midstream	*WS5*	0.0254	0.0013	0.0267	5.12	0.0346	0.00081	**0.0354**	2.34	-	-	-	-	-	-	-	-
Downstream	*WS4*	0.0248	0.0013	0.0261	5.24	0.0359	0.00089	**0.0368**	2.48	0.0323	0.00075	0.0331	2.32	-	-	-	-
Downstream (25 m)	-	-	-	-	-	-	-	-	-	0.364	0.00089	**0.3649**	0.24	-	-	-	-
Spring 1 (on-Site)	-	-	-	-	-	-	-	-	-	0.318	0.00177	**0.3198**	0.56	TBC	TBC		
Spring 2 (on-site)	-	-	-	-	-	-	-	-	-	-	-	-	-	1.255	0.001	**1.2560**	0.08
Spring 3 (75 m downstream)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.236	0.002	**0.2380**	0.85

Surface water data ordered in flow direction

Groundwater data spring water

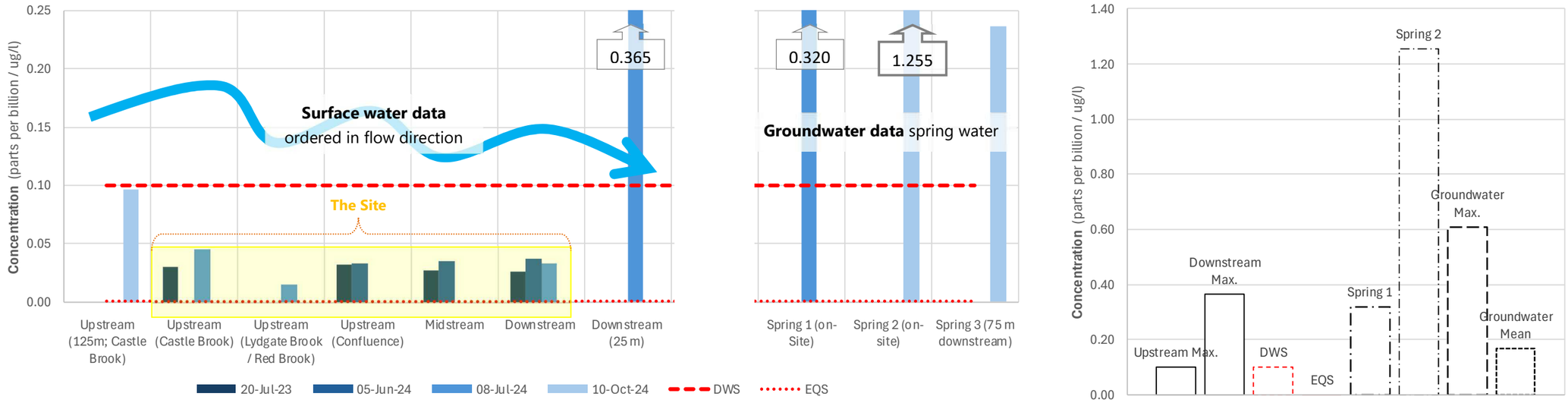
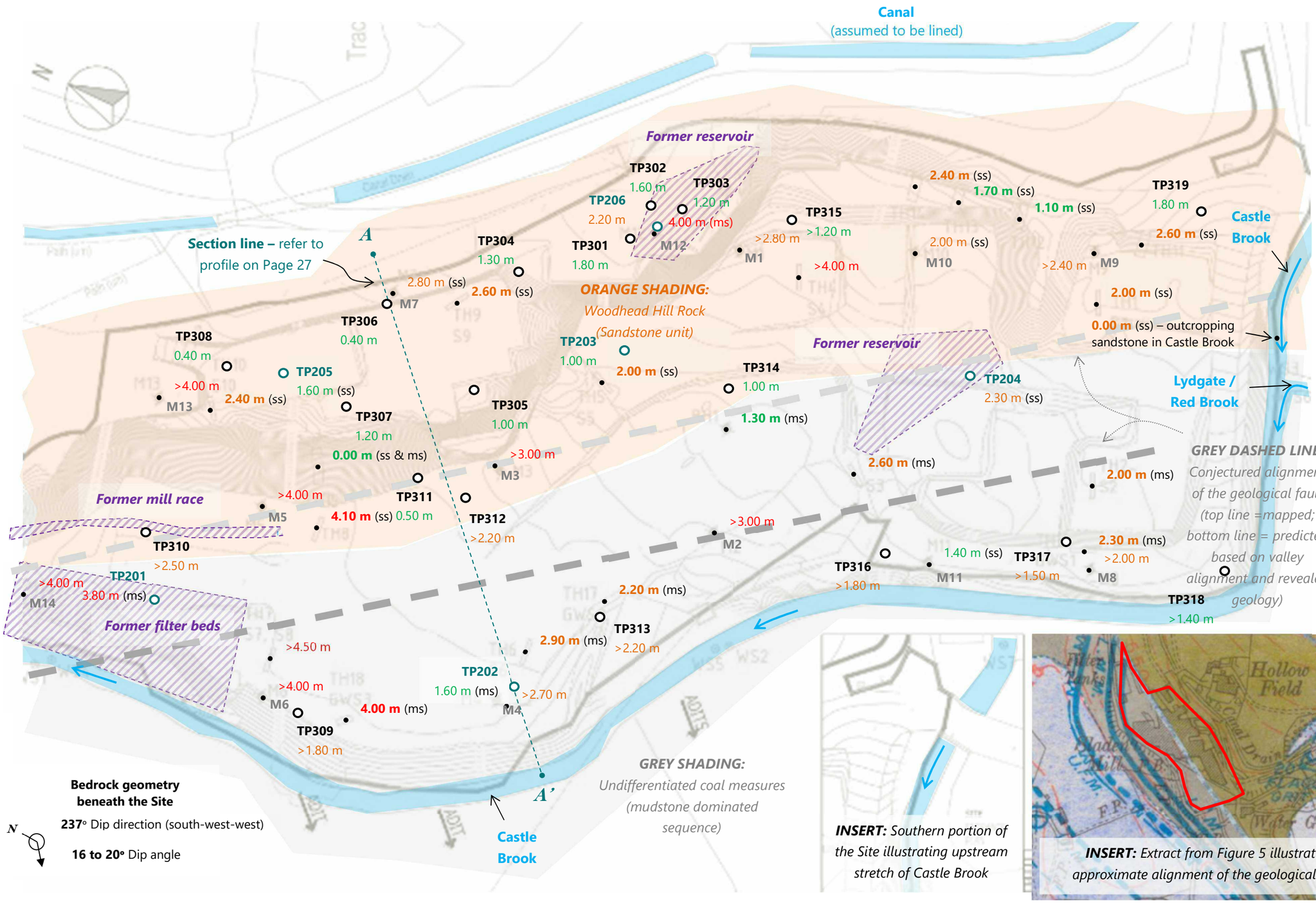


Figure 8 – Tabulated and graphical presentations of PFAS surface water monitoring data (and maximum and mean groundwater concentrations for comparison)

> Table: key 'maximum' concentrations highlighted light yellow

> Left hand graph illustrating spatial and temporal trends in surface water quality data compared against different 'standards'; right hand graph comparing maximum concentrations at key locations including in groundwater (GW)

5.0 **Ground Model** – Baseline (Current Condition) – Plan – Geological Setting (depth to bedrock deposits)



Key

Depths to bedrock and bedrock types (mudstone, ms & sandstone, ss) mapped across exploratory hole positions and colour coded based on depth ranges of:

0 to 1.99 m = 'shallow'

1.99 to 2.99 m = 'moderate'

> 2.99 = 'deep'

Bold text = bedrock confirmed

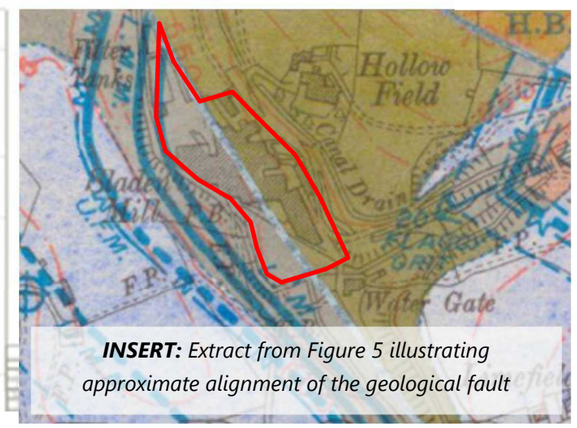
Purple = key sub-structures

- Machine excavated trial pit (October 2024)
- Machine excavated trial pit (February 2025)

Notes

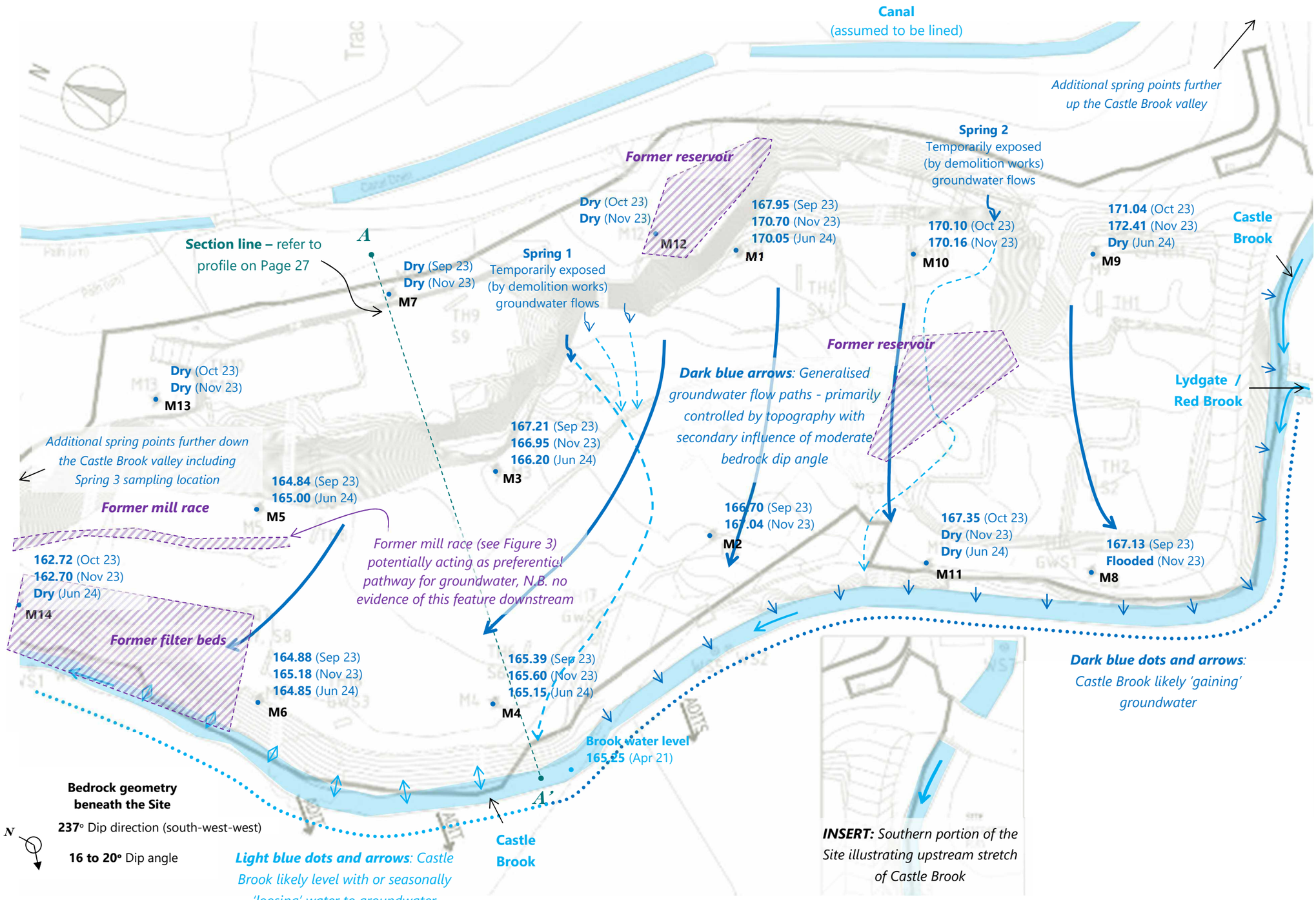
1. The accuracy of the historic exploratory hole positions cannot be confirmed and should be taken as approximate (no coordinates supplied).
2. Drawing is indicative only – do not scale.

INSERT: *Southern portion of the Site illustrating upstream stretch of Castle Brook*



INSERT: *Extract from Figure 5 illustrating approximate alignment of the geological fault*

5.0 **Ground Model** – Baseline (Current Condition) – Plan – Hydrogeological and Hydrological Setting



Key

Groundwater related features illustrated in dark blue.

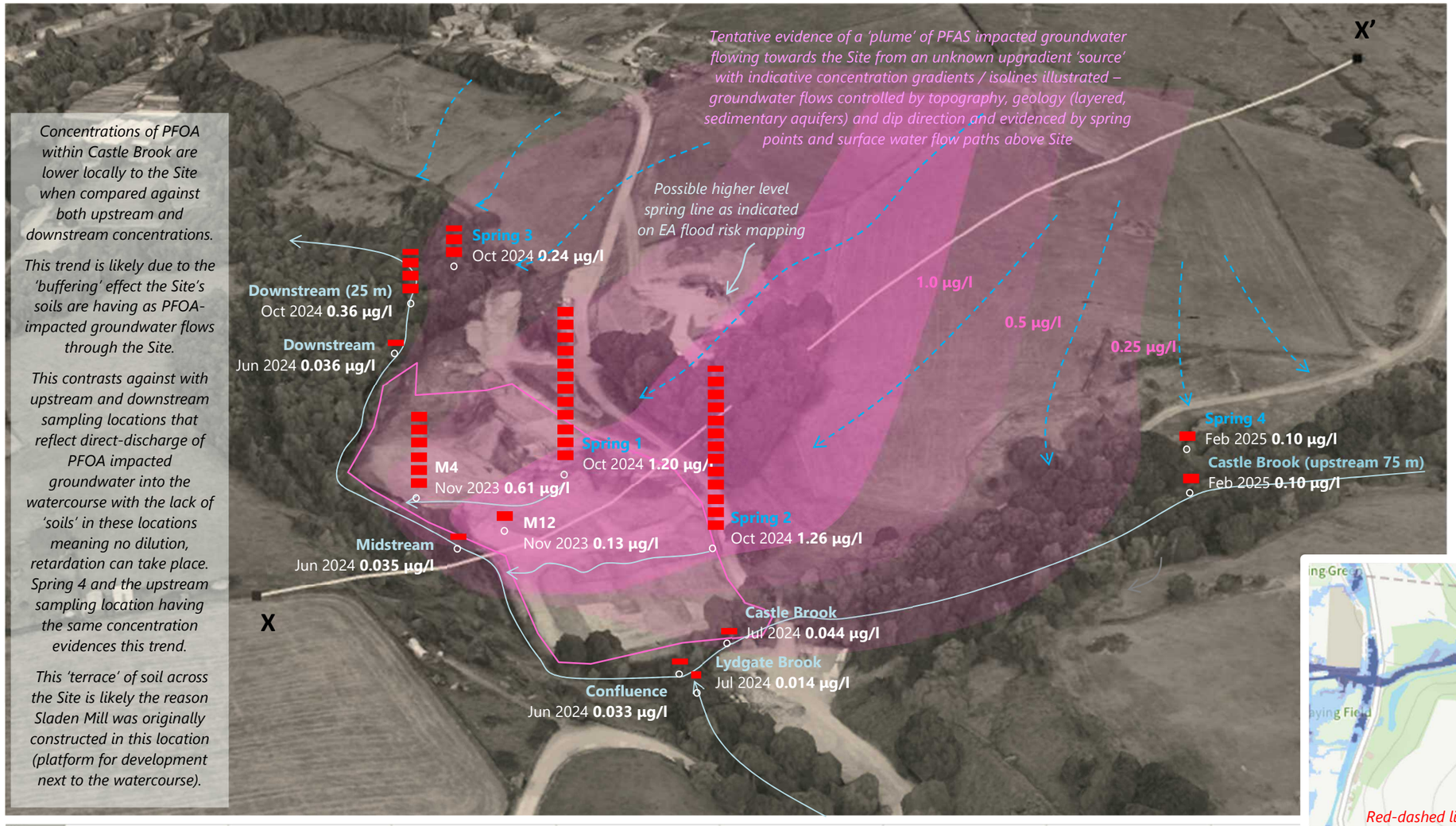
Surface water related features illustrated in light blue.

Seepage / spring points with bolder lines representing the more dominant / persistent flows (based on visual comparison across two most recent Site visits) and light blue dashed lines representing main flow paths across the Site.

Notes

1. The accuracy of the historic exploratory hole positions cannot be confirmed and should be taken as approximate (no coordinates supplied).
2. Drawing is indicative only – do not scale from drawing.

5.0 **Ground Model** – Baseline (Current Condition) – Isometric View – Spatial Distribution of maximum PFOA Concentrations Groundwater and Surface Water on Site and locally to the Site

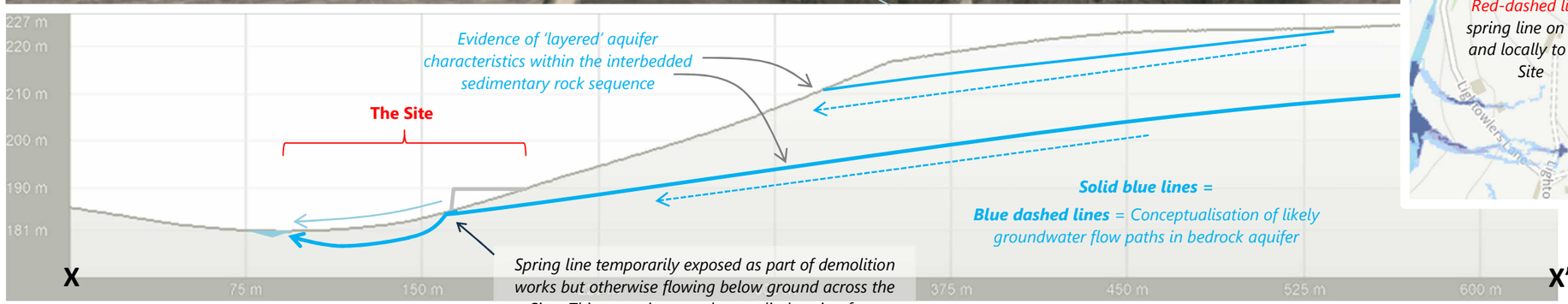


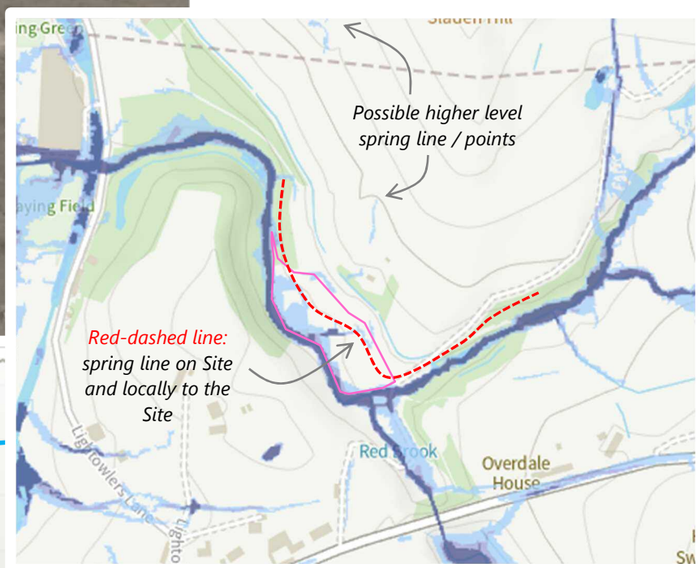
Key

Blue dashed lines = *Conceptualisation of likely groundwater flow paths in bedrock aquifer*

Light blue lines = *Surface water flow paths*

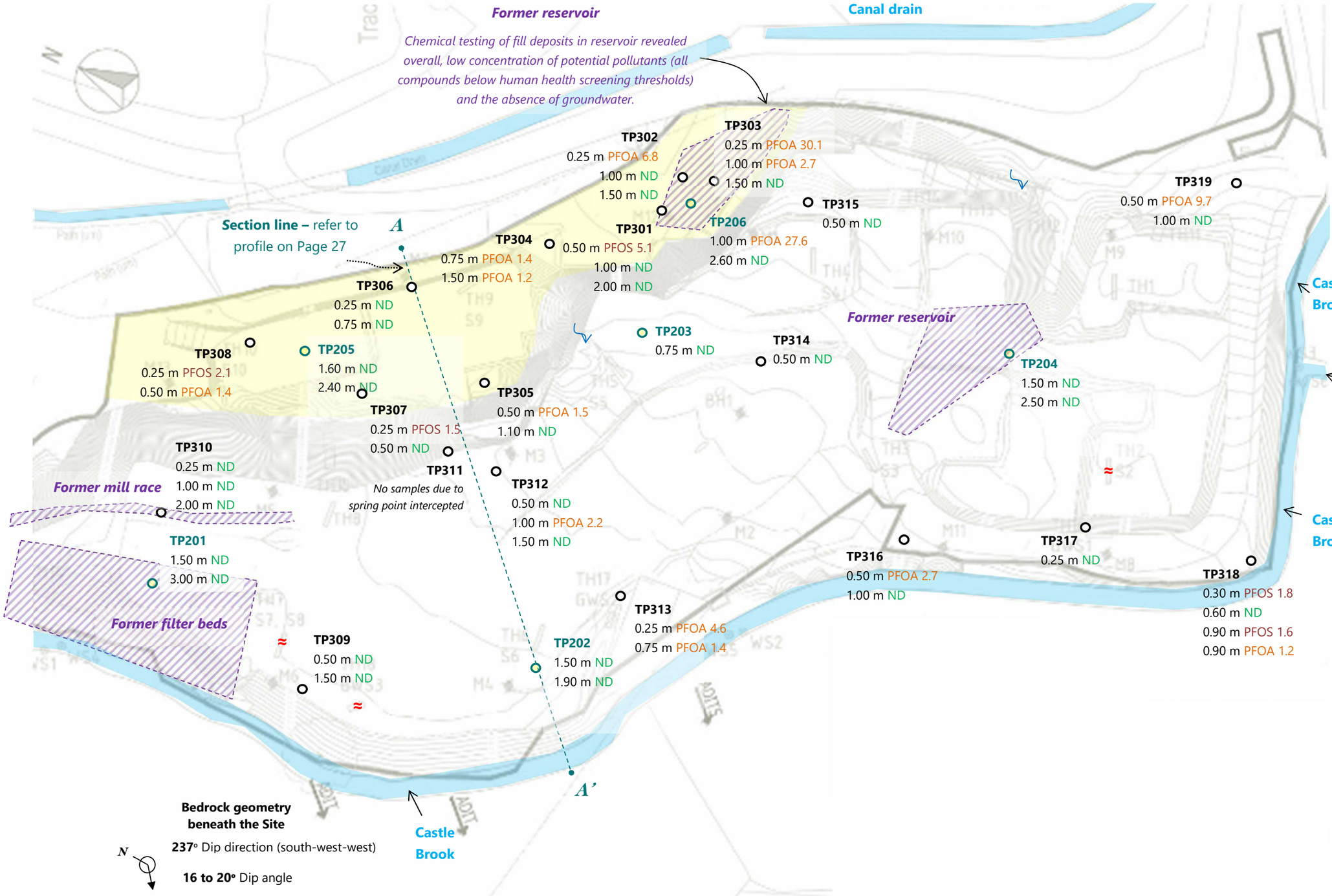
Red blocks = conceptual illustration of relative concentrations of PFOA with one 'full' block = 0.1 µg/l





Extract from Environment Agency flood mapping (surface water)

5.0 **Ground Model** – Baseline (Current Condition) – Plan – Spatial Distribution of PFOA & PFOS Concentrations in Soil on Site (refer to table in Section 4.8 also)



Key

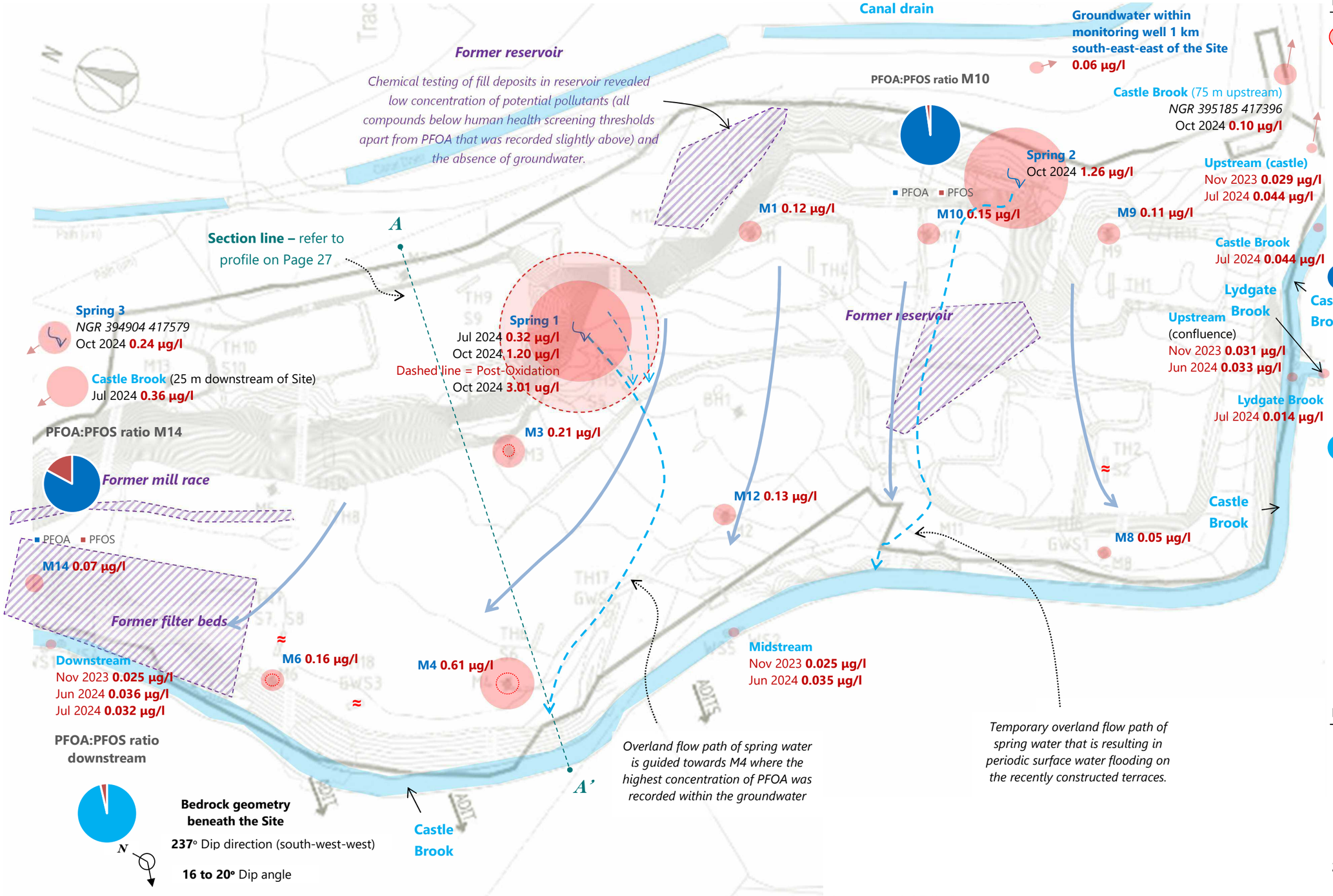
- Soil sampling location and depth (200 series holes)
- Soil sampling location and depth (300 series holes)

Category 4 Screening Level (interim) for PFOA = 7.6 µg/kg

Notes

1. The accuracy of the historic exploratory hole positions cannot be confirmed and should be taken as approximate (no coordinates supplied).
2. Drawing is indicative only – do not scale from drawing.

5.0 **Ground Model** – Baseline (Current Condition) – Plan – Spatial Distribution of PFOA Concentrations in Groundwater and Surface Water on Site and locally to the Site



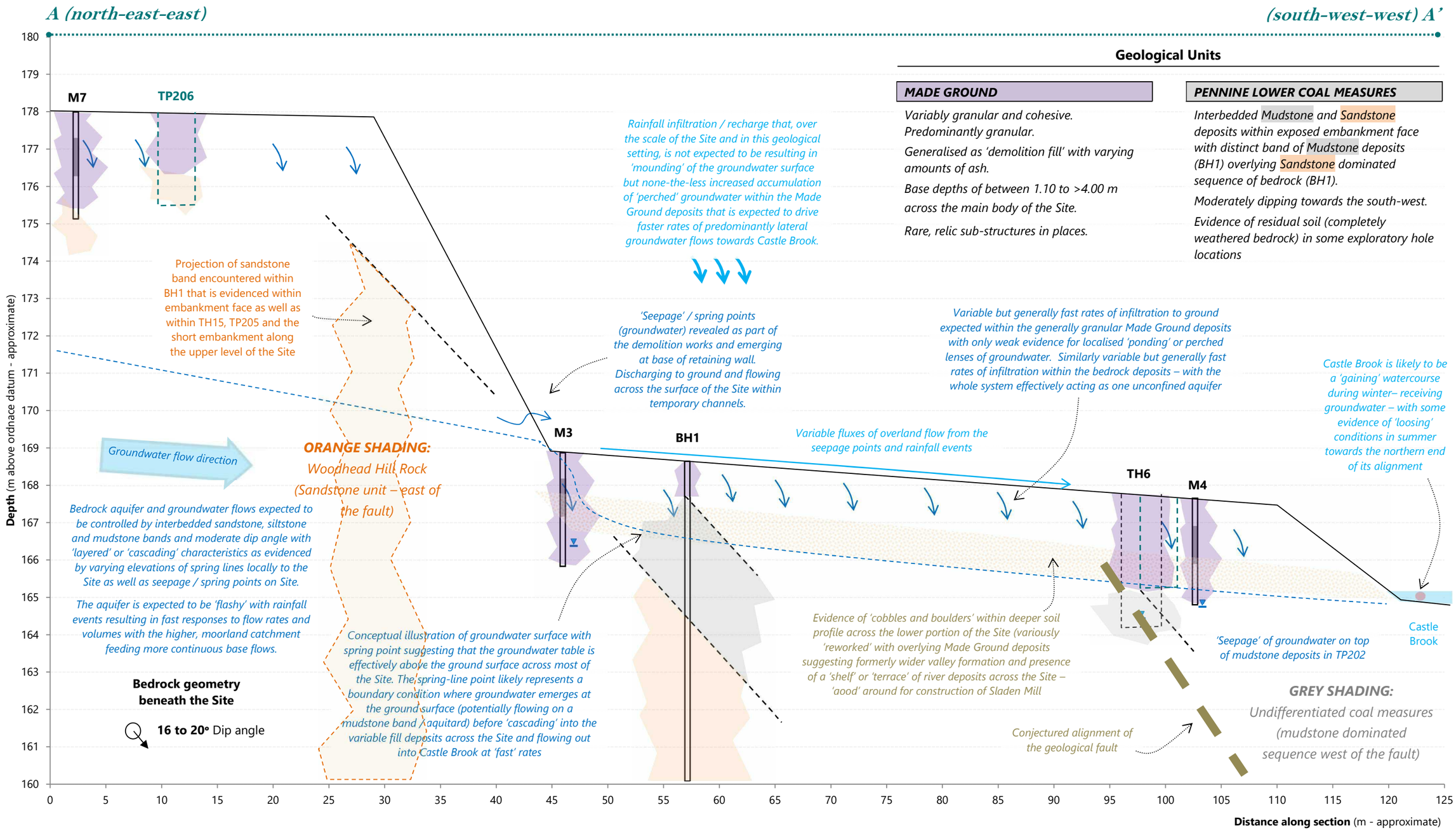
Key

- Concentration 'bubbles' scaled compared to 0.1 µg/l (Drinking Water Inspectorate standard) for relative comparison and distribution of PFOA in groundwater and surface water.
- Maximum concentration reported and represented as shaded circle with minimum concentration illustrated by dashed line.
- Average ratios of PFOA to PFOS (across all groundwater data) were 9.56% indicating the original source of PFAS is unlikely to be AFFF.
- Highest (M14) and lowest (M10) ratios illustrated on the plan.
- Average ratios of PFOA to PFOS (across all surface water data) were 3.77 % indicating the surface water source of PFAS is unlikely to be AFFF with 'slightly lower' ratios to those found groundwater.
- ≈ Evidence of NAPL as visual or olfactory marker (trial pits only)

Notes

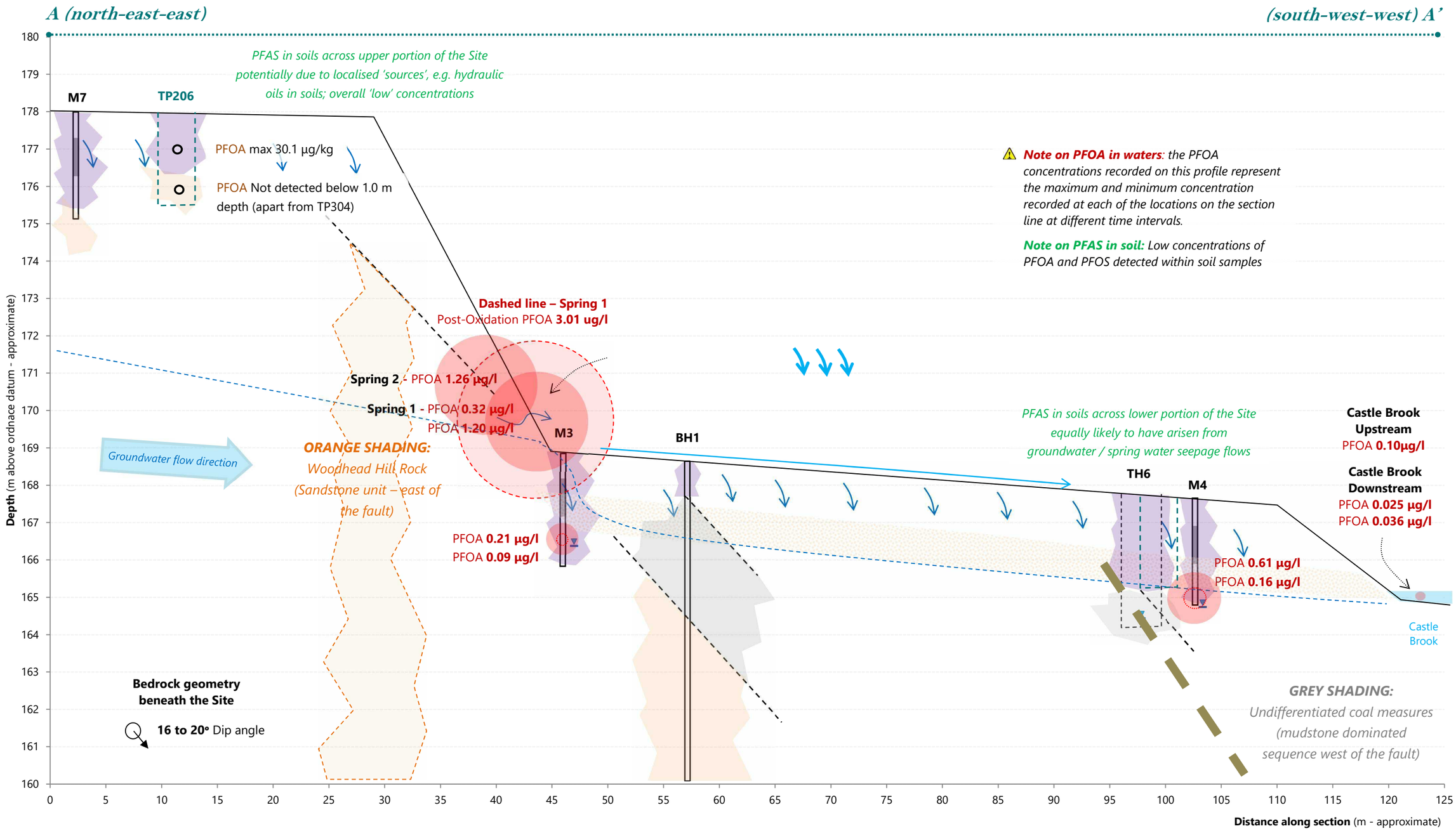
1. The accuracy of the historic exploratory hole positions cannot be confirmed and should be taken as approximate (no coordinates supplied).
2. Drawing is indicative only – do not scale from drawing.

5.0 **Ground Model** – Baseline (Current Condition) – Profile (*aligned with dip direction of bedrock*) – Focus on Geology and Hydrogeology



Illustrative / conceptual only – do not scale from drawing – note compressed horizontal axis that exaggerates dip angle

5.0 **Ground Model** – Baseline (Current Condition) – Profile (*aligned with dip direction of bedrock*) – Focus on PFAS Distribution



Illustrative / conceptual only – do not scale from drawing – note compressed horizontal axis that exaggerates dip angle

6.0 Controlled Waters Risk Assessment

ⓘ ***The Risk Management Process***

Screening for hazards is first stage of risk management; establishing whether a hazard exists (that could present a risk). The scope of this Report focuses on one specific 'historical' hazard – potentially polluting material.

Once the hazard is identified, i.e. material has been encountered that presents a potential risk of pollution, the second stage of risk management starts; establishing if the risk presented is acceptably low or not and, if not, what action is required to either further assess the risk or reduce this risk to acceptably low levels.

This decision-making process based on the stages set out in current guidance[14].

Lines of evidence are used across both stages to inform the assessment. These lines of evidence relate to both the Site itself, the inherent hazards in the ground, and the proposed development, i.e. how other groundworks affects risk.

Site investigation and characterisation is based on judgements being made relating to discrete data points (trial pits and boreholes commonly) across much larger site areas. It therefore follows that unexpected encounters can arise even where all available information (or evidence) indicates a hazard is not present.

6.1 General comments

The commentary presented within this section should be read in conjunction with the background information and reporting relating to the Site that includes the raw data, i.e. the original chemical testing certificates.

6.2 Definition of potential 'Sources'

Chemical testing of the Made Ground (and to a lesser extent underlying natural soils) deposits across the Site revealed:

> A 'chemical fingerprint' that is broadly consistent with that anticipated on a former Victorian-era mill (combustion by-products; PAHs, sulphate and ash-derived toxic metals and non-metals, e.g. lead and arsenic) that was more recently redeveloped as a modern manufacturing centre of uPVC products for the construction sector (weathered oil-range hydrocarbons detected in select locations noting an absence of fuel-related BTEX compounds).

> The presence of low concentrations of PFAS compounds (in soils) across the upper and lower positions of the Site noting a localised area of higher concentrations (TP206 and TP303).

> A generally 'less degraded than anticipated' chemical profile with concentrations of inorganic and organic species 'low' in comparison to those typically encountered on former mill sites based on the Author's experience and the trends in chemical testing data.

  For example, the presence of disperse asbestos within the Made Ground soils guides risk to human health with the chemical quality of this material otherwise generally below screening thresholds for the proposed residential end use. Elaborating on this further; the maximum and mean (arithmetic) concentration of arsenic in the Made Ground soils across the Site was 94 mg/kg and 23 mg/kg respectively; similarly, the maximum and mean (arithmetic) concentration of benzo(a)pyrene was 53 mg/kg and 3 mg/kg respectively

  Localised areas of suspected 'free-product' were identified as either visual (staining) or olfactory (odours) evidence of hydrocarbons. Chemical testing of soils and groundwater in these locations (that included a simple 'grab' sample of groundwater in TH18) confirmed the presence of weathered oil; possible hydraulic oil (heavy range aliphatic and aromatic hydrocarbons >C16).

Chemical testing of the groundwater across Site revealed:

> The presence of various chemical compounds at 'elevated' concentrations to the extent that the groundwater across the Site could be described as 'degraded'.

> No discernible pattern to the chemical quality of the groundwater (noting the presence of the previously discussed 'free-product' within localised areas) that, based on the heterogeneous nature of the Made Ground deposits, is considered to represent single source, i.e. there are no areas where the chemical fingerprint of the soils suggests a different material is present.

> A 'chemical fingerprint' of these compounds that broadly consistent with that anticipated on a former Victorian-era mill (combustion by-products; PAHs, sulphate and ash-derived toxic metals and non-metals, e.g. lead and arsenic; and tars; phenols). Notwithstanding this, there is only a weak, qualitative correlation between the 'soil source' and the 'groundwater source' with only sulphate elevated across both media.

  Simple examples of this difference in chemical compositions include: i) a maximum concentration of phenol within the soils of 0.7 mg/kg compared against a max and mean (arithmetic) concentrations within groundwater of 100 µg/l and 87.1 µg/l respectively; and, ii) a maximum concentration of hexavalent chromium within the soils of <0.50 mg/kg compared against a max and mean (arithmetic) concentration within groundwater of 10 µg/l and 6.3 µg/l respectively.

> The presence of PFAS compounds within the groundwater that ratio analysis (PFOA to PFOS) confirms not to be associated with Aqueous Film Forming Foam (AFFF) used in fire suppressants but more likely waterproofing compounds.

  The only identifiable use of PFAS compounds on Site is considered to be additives to hydraulic oils that would have been used as part of the Site's more recent use as a uPVC product manufacturer. However, it is noted that the Environment Agency highlighted emerging research from Australia that indicates plasticisers, that can be used during PE extrusion, have been found to contain PFAS.

  Related to the point above, there is no evidence to indicate that uPVC was synthesized on the Site (from the more toxic and potentially polluting vinyl chloride) but rather Alderbergh Ltd involved with the manufacture (shaping and extrusion) of LDPE products from pellets as detailed more fully within Section 3.1.

[14] *Environment Agency's Land Contamination Risk Management (2020).*

Chemical testing of the spring water revealed:

> Concentrations of PFAS within the spring water emerging on the eastern edge of the Site (max. PFOA = 1.26 µg/l in Spring 2) that are around thirty times higher than the concentrations within Castle Brook as it passes the Site.

  It is noted that surface water samples upstream and downstream of the Site were found to have higher concentrations of PFOA compared to Castle Brook as it passes the Site, further commentary on which is detailed within Section 6.4.

  This of itself, confirms the primary source of PFAS is not on Site owing to: i) the 'flashy' nature of the groundwater regime locally; ii) the shallow presentation of bedrock west of these spring points; and, iii) elevated concentrations of PFOA within Spring 3 (downstream of the Site) and Spring 4 (upstream of the Site) both of which are remote and hydraulically unconnected to the Site (no plausible pathway).

  With respect to the presence of PFAS within the shallow soils of TP206 and TP303, at the concentrations recorded, this is not considered to be an abiding source of PFAS within the soils that is contributing to the elevated concentrations of PFAS within the spring water or groundwater beneath the Site. This is due to both the reducing concentrations of PFAS with depth in these locations indicating limited, or negligible, downward migration of the PFAS (also noting the presence of hardstanding cover in these locations) and the overall low concentrations of PFAS (max. 30.1 µg/kg POFA) indicating the overall 'mass' of PFAS within the shallow soils across this portion of the Site is low and unlikely contributing to PFAS concentrations within the spring water or groundwater beneath the Site.

Summary: Based on these chemical profiles (across all soils and waters tested) and supporting lines of evidence it is concluded that:

> Owing to the weak correlation between the soil and groundwater quality datasets and the presence of elevated concentrations of PFAS within the spring water and low concentrations in the soils on Site, it is likely that;

  i) The soil source on Site (all chemical compounds) represents a markedly diminished source of potentially polluting material that has been 'washed through' (leached) through by both continuous groundwater flow (from the springs) and, to a lesser extent, the successive cycles of rainfall since the Site has been left disused; and/or,

  ii) With specific reference to PFAS, the groundwater quality is reflective of 'ambient' levels locally with the groundwater encountered beneath the Site being continuously recharged by the springs present along the eastern border of the Site. This water flows through the Site at high rates and volumes and ultimately discharges into Castle Brook.

> Taken together, whilst the Site's groundwater is identified as a 'source' of potentially polluting material, it is diminished and being discharged into by fast flowing and high volumes of spring water (groundwater) that, for PFAS compounds, represents a more significant source of potentially polluting material, and one that not located on-Site.

  With respect to the latter point, the soils and groundwater across the Site are therefore also identified as 'receptors' that are being adversely impacted by PFAS containing groundwater.

  Whilst only marginally elevated relative to soil and groundwater concentrations across the Site, the potential presence of 'free product' hydrocarbons locally to TH2, TH7 and TH18 are also identified as specific sources of potentially polluting material.

6.3 Definition of potential 'Pathways'

The surface water regime across the Site is characterised by:

i) The locally steep topography resulting in generally 'flashy' conditions dominating, i.e. heavy rainfall leading to high fluxes (rates and volumes) of surface water flows and run-off.

ii) The presence of a variably but generally highly permeable surface cover that, at the point of issue, is resulting in a tendency for rainfall landing on the Site to infiltrate to ground – recharging groundwater;

iii) The presence of temporarily exposed 'spring' points along the eastern boundary of the Site that both discharge to ground and, under periods of heavy rainfall, result in overland flows across informal channels towards Castle Brook on the western edge of the Site.

The groundwater regime across the Site is characterised by:

i) Similar characteristics to the surface water regime with the moderate and westerly dipping bedrock further contributing to 'flashy' conditions and fast rates of groundwater flow dominating within the catchment. This is evidenced by the marked change in flow rates from the 'springs' on the eastern boundary of the Site before and after rainfall events and the presence of east to west groundwater flows on the surface of the bedrock deposits within the trial pits.

ii) Recharge of the groundwater on Site being both spring and rainfall fed. Spring-based recharge is likely dominating due to the continuous nature of these flows (with varied rates and volumes) and rainfall recharge contributing to dilution of chemicals within the groundwater beneath the Site.

iii) Groundwater levels that are suggestive of a 'gaining' watercourse (Castle Brook) across the southern two thirds of the Site (feeding base flow of Castle Brook) and a 'neutral' or possible loosing watercourse across the northern third of the Site (water 'lost' from Castle Brook into groundwater).

iv) Through this 'flashy' characteristic, a tendency for lateral migration to dominate, driven by the fast groundwater flow conditions within the bedrock aquifer locally to the Site.

v) The presence of heterogenous Made Ground deposits into which rainfall and spring water will percolate and collect leading to both the temporary storage of water within the ground and discrete flow paths that, where present, were found to fast rates of flow that are more likely reflective of surface water rates, i.e. flow rates (permeability) potentially around 0.1 m/s but measured at rates greater than 10^{-4} m/s.

  This rate of flow was evidenced within; i) both rounds of trial pitting completed across the Site with 'fast' rates of east to west lateral flow evidenced on the bedrock surface; and, ii) through falling head testing completed within boreholes M3, M6 and M9.

vi) The presence of a massive sandstone unit (likely the Woodhead Hill Rock) and possible fault zone either of which represent more preferential pathways for the vertical migration of water and any associated chemical compounds. It is noted that the moderately dipping bedrock and spring fed recharge of the Site are likely resulting in a far greater rate of lateral groundwater movement relative to vertical groundwater movement with the fault tentatively mapped along the centre of the Site (along the alignment of Castle Brook and Lydgate Brook).

6.4 Definition of potential 'Receptors'

The Controlled Water receptors identified include:

> Castle Brook (surface watercourse) immediately west of the Site – *a watercourse for which the environmental quality is unknown but lying within a currently rural dominated catchment noting the historical presence of various mills upstream of the Site (including along Lydgate Brook).*

> The bedrock aquifer beneath the Site – characterised by; high vulnerability (sandstone dominated bedrock) with Secondary A classification, and a lack of Source Protection Zones or other recorded potable abstractions within 1 km of the Site.

  It is noted high concentrations of PFAS compounds have been confirmed within spring water on and off Site and therefore, whilst strictly it remains a potential receptor, it is more appropriately considered as a 'source' in this scenario.

> Soils across the Site – *as discussed previously within Section 6.2.*

For completeness, Castle Brook is a tributary of the River Roch that represents an indirect surface water receptor and similarly, human health is noted as potential receptor that, whilst beyond the scope of this Report, is carried through within Soil and Structure's Remediation Strategy ref. 20403-R-002-V04.

6.5 Assessment of risk to Controlled Waters

Nationally, the Site is located within an area of the UK where the chemical treatment of fabrics using PTFE and other PFAS-based compounds first developed.

Sladen Wood Mill (separate to Sladen Mill) within the lower lying Littleborough/Summit area was a centre of research and development for PTFE and PFAS related finishes to fabrics.

Regionally, the Littleborough area included a high concentration of mills and other facilities involved with the dying and finishing of fabrics including mills higher in the water catchment locally to the Site, i.e. Wellfield Mill.

Sladen Mill itself was ultimately repurposed as a "cotton raising and fulling mill", a mechanically dominated process, prior to the commercial use of PFAS within the UK textile market. It is however noted that bleaching and dying was completed at Sladen Mill over a short period of time (c. 1960s to 1980s) that does correspond with the same period that PFAS-based coatings were being developed at the separately owned Sladen Wood Mill. Locally, various mills were recorded as "finishing and dying mills" before and after this date.

The more recent use of the Site by Alderburgh Ltd involved the mechanical process of LDPE extrusion and moulding with any liquid based waterproofing products advertised on the company website, wholesaled from the Site in pre-packaged containers. Most of the waterproofing products were bituminous based coatings however, as noted by the Environment Agency, emerging research from Australia indicates plasticisers, that can be used during PE extrusion, have been found to contain PFAS.

Whilst two key Controlled Water receptors are identified; the bedrock aquifer and Castle Brook immediately to the west of the Site, the identification of the soils and groundwater beneath the Site as potential 'receptors' is guiding in the assessment of risk to Controlled Waters.

More specifically, there are multiple lines of evidence of soils and groundwater beneath the Site being impacted by PFAS the primary source of which is not on Site.

Therefore, the soils and groundwater beneath the Site have been, and continue to be, adversely impacted by PFAS compounds that have been transported onto Site.

It follows that any risk mitigation works in relation to PFAS on the Site itself, stand to have limited efficacy when the primary source is beyond both the control and responsibility of the Site owner.

Notwithstanding this pollutant-linkage, the soils and groundwater beneath the Site having been impacted by PFAS (and other chemicals) and therefore continue to represent sources of potentially polluting material albeit, with respect to PFAS – the main chemical of concern – to a much lower extent than off-Site sources.

Furthermore, further investigation of off-Site sources is not considered to be the duty of the Client.

Taken together, there are multiple lines of direct and indirect evidence indicating that the Site's soil and groundwater have been degraded by its historical, industrial uses however, with specific reference to PFAS (the main chemical of concern) the Site is: i) located within an area where PFAS is present in surface water and groundwater at concentrations orders of magnitude higher than the freshwater EQS; and, ii) represents a receptor itself, receiving high concentrations of PFAS from at least two confirm spring points (Spring 1 and Spring 2) but likely the full spring-line along the eastern boundary of the site.

6.6 Risk assessment conclusion

Based on this assessment, the risk presented to Controlled Waters from sources identified on the Site is assessed as **moderate** to **low** with the moderate classification acknowledging that:

> PFAS has been detected within the soils on Site at low concentrations. Across the lower portion of the Site, the groundwater flows from the spring-line along the eastern edge of the Site have likely influenced soil quality. Across the upper portion of the Site, locally to TP206 and TP303, the presence of PFAS within the shallow soils is unlikely to have been influenced by the groundwater however, various lines of evidence point towards them not having represent a specific source of PFAS adversely impacting groundwater beneath the Site; and,

> Concentrations of other chemicals have been recorded at elevated concentrations within the groundwater beneath the Site that have not been linked to the groundwater emerging from the spring-line. Notwithstanding this, the concentrations recorded are relatively low compared to both respective environmental standards and the concentrations of PFAS within groundwater emerging from the spring-line that is the primary source, and chemical of concern in this scenario.

The recommended risk mitigation measures are distinct from those inherent risk mitigation measures that will be incorporated as part of the development, e.g. reduction of infiltration through an increase in impermeable areas and introduction of new utility trenches.

6.7 Risk mitigation recommendations

The recommended risk mitigation measures are illustrated on the Ground Models (endline) within Section 7.0.

Soils (locally to TP206 and TP303): Recommended risk mitigation – source removal: Development proposals across this portion of the Site include for a reduced level excavation to suit formation levels (new access road to upper portion of the Site) resulting in a net 'cut' of soils from this portion of the Site. This action itself is anticipated to reduce the overall volume of PFAS-containing soils across this portion of the Site.

As a specific, Controlled Waters remedial measure, as part of this reduced level excavation it is recommended that at least 1.0 m of soil are removed from the area of TP206 and TP303.

Reasoning: to remove PFAS-containing soils from this area and therefore reducing PFAS concentrations across the Site as a whole to: max: 9.7 µg/kg; mean: 0.77 µg/kg; and, UCL 1.31 µg/kg.

Measurables: Check testing (for PFOA and PFOS) of the soils at the base and all edges of the excavation is recommended to validate the efficacy of this recommended remedial action details of which are set out within Soil and Structures' Remediation Strategy.

Soils (locally to TH2, TH7 and TH18): Recommended risk mitigation – source removal: Excavation, delineation and removal of hydrocarbon impacted soils locally to TH2, TH7 and TH18.

Reasoning: to further investigate and, through removal, reduce the mass of hydrocarbon impacted soils further details of which are set out within Soil and Structures' Remediation Strategy.

Measurables: As an 'in-principle' remedial action, visual and PID screening of materials (together with photographic evidence) is recommended to validate the efficacy of this recommended remedial action details of which are set out within Soil and Structures' Remediation Strategy.

Groundwater (general): Groundwater management system: Groundwater is emerging from the eastern boundary of the Site that is impacted by PFAS (PFOA dominated) the source of which lies outside of the Site boundary. The Site is serving as a pathway for this PFAS impacted groundwater to enter groundwater beneath the Site and thereafter, Castle Brook.

Reasoning and Measurables: Management of this PFAS impacted groundwater is key to both the management of risk on Site as well as to Castle Brook, the primary Controlled Waters 'receptor'. Treatment of this water will be completed under a Discharge Consent (to be agreed) to achieve a betterment of water quality within Castle Brook by limiting the discharge of poisonous, noxious or polluting matter (PFAS impacted groundwater).

Regulatory consultation: whilst inherent to the process of planning condition discharge for the proposed development, it is recommended that continued consultation with the Environment Agency is maintained throughout the project owing to the regionally significant concentrations of PFAS compounds that have been detected within groundwater flowing onto the Site and within surface waters locally to the Site.

In this scenario, further investigation on or around the Site by the Environment Agency may be warranted with the findings of any such study valuable information for both parties.

Remedial recommendation made within existing ground-related reporting: within their "*Hydrogeology and Potential Contaminant Transport*" dated May 2024 (Revision 0) TBJA recommended that a low permeability layer was incorporated within proposed soft landscaping areas as a form of pathway intervention, limiting the rate of drainage to ground and thus the flux of chemicals (all types) through the soils and groundwater across the Site.

Whilst practically difficult to install, e.g. ensuring thickness consistency and service corridors typically resulting in a 'leaky' cover layer, this remedial recommendation is discounted due to; i) the fact the dominant spring-fed recharge of groundwater will not be captured by this approach; and, ii) to the inclusion of a low permeability layer within cover systems liable to result in water logging or possible surface water flooding within soft landscaping areas.

6.8 Residual uncertainty

With specific reference to the penultimate consultation response from the Environment Agency, the following commentary addresses areas of residual uncertainty:

- It is assumed that '*other environmental data that the Environment Agency have access to*' relates to the background data relating to PFAS concentrations within groundwater locally, as discussed within Section 3.0;
- Whilst only two compounds were modelled as part of the analytical modelling presented within the existing reporting (the Remedial Targets Methodology), the use of any form of analytical modelling in this scenario is not recommended due to: i) the inherent heterogeneity of the Made Ground deposits rendering any analytical model a very crude approximation of the fate and transport of chemicals within groundwater, likely under-reporting the risk to Controlled Water receptors; and, ii) the presence of maximum concentrations of PFAS within groundwater beneath the Site (borehole M4) being located at a distance of around 10 m from Castle Brook that, of itself, would guide the requirement for further assessment and/or risk management (as detailed within this Report).
- As discussed previously within Section 6.5, the use of target concentrations in this scenario is not considered appropriate noting that a numerical value will be required for the PFAS impacted groundwater that is to be managed as part of the works
- The general remark that; "*We {the EA} continue to feel that the site will need the benefit of remediation*", is acknowledged through the remedial actions recommended within this Report.

More in-depth commentary in response to the Environment Agency's more recent consultation response and meeting minutes is provided separately to this Report.

6.9 Contingency planning

As part of any risk management, contingency planning is recommended. In this scenario, three key areas of contingency planning are recommended.

Unforeseen encounters: A general advisory, there remains the potential for unidentified sources of potentially polluting material to be encountered as part of the development works for which a response plan is recommended (and set out within Soil and Structures' Remediation Strategy).

In this scenario, the potential presence of residual sub-structures is highlighted with any relic drains or culverts potentially serving as both sources and critical pathways for the potentially polluting material to be present and to be transported across the Site and towards other key receptors, e.g. Castle Brook.

Third-party liabilities: There is evidence that the Site soils and groundwater have become impacted by PFAS compounds that have been transported onto Site from off Site sources. In having become impacted, the soils and groundwater on Site have themselves become a source of PFAS compounds. The requirement for any risk mitigation works therefore rests, to a certain extent, on the soils and groundwater having been impacted with evidence supporting this being due to the action of third parties (other landowners).

Investigation and assessment of the source of the PFAS compounds (and any other chemicals present within the spring water) may wish to be considered to further support a reduction in potential liability for the Client.

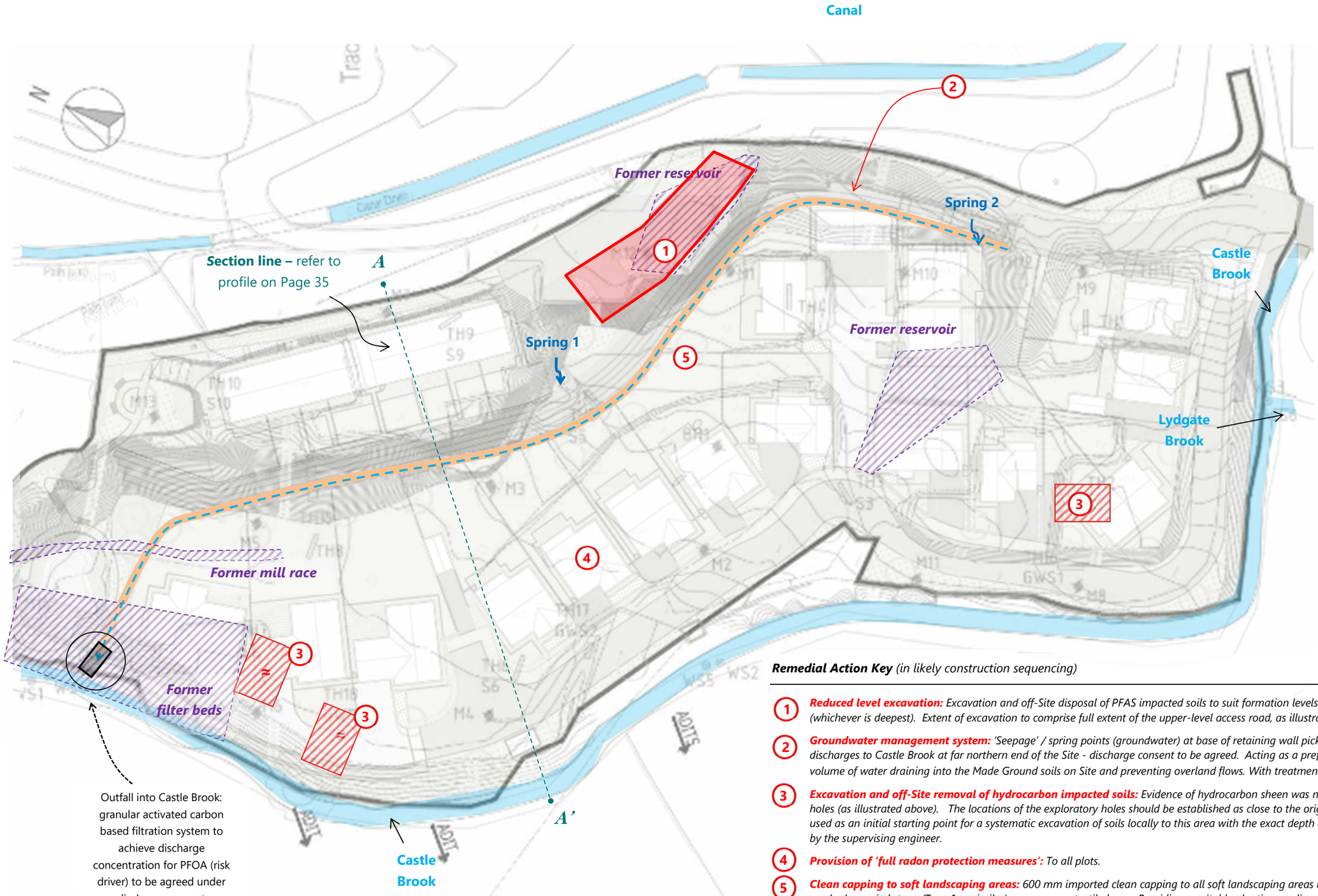
Residual liabilities: Related to third-party liabilities, even when the recommended risk mitigation is completed satisfactorily, there remains the potential for future investigations into water quality within the local catchment to include investigations on and around the Site that, in the absence of this Report or other clarifications, could lead to unnecessarily protracted and costly investigations where lines of responsibility are not easily established, e.g. why PFAS impacted water continues to discharge into Castle Brook?

Measures to limit the potential for this to occur include:

> Submission of this Report and the Soil and Structures Remediation Strategy (report ref. 20403-R-002-V04) to the local planning authority for upload onto the planning portal; and,

> The incorporation of this Report and the Soil and Structures Remediation Strategy (report ref. 20403-R-002-V04) within the Health and Safety File for the development.

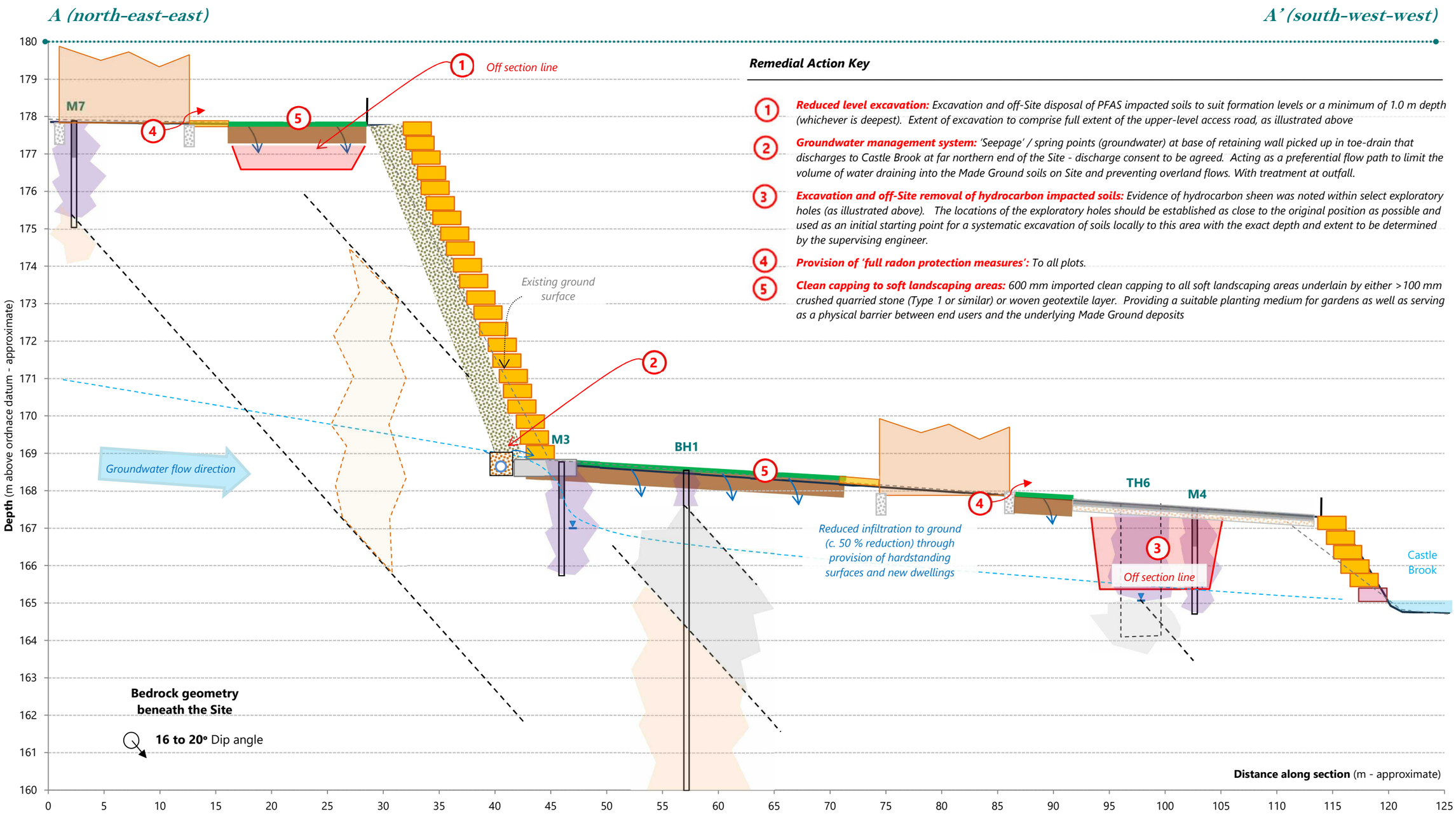
7.0 **Ground Model** – Endline (*Post-Development Condition*) – Plan *(presenting an overview of the Remedial Actions – including measures to reduce risk to human health)*



Remedial Action Key *(in likely construction sequencing)*

1. ***Reduced level excavation:*** *Excavation and off-Site disposal of PFAS impacted soils to suit formation levels or a minimum of 1.0 m depth (whichever is deepest). Extent of excavation to comprise full extent of the upper-level access road, as illustrated above*
2. ***Groundwater management system:*** *'Seepage' / spring points (groundwater) at base of retaining wall picked up in toe-drain that discharges to Castle Brook at far northern end of the Site - discharge consent to be agreed. Acting as a preferential flow path to limit the volume of water draining into the Made Ground soils on Site and preventing overland flows. With treatment at outfall.*
3. ***Excavation and off-Site removal of hydrocarbon impacted soils:*** *Evidence of hydrocarbon sheen was noted within select exploratory holes (as illustrated above). The locations of the exploratory holes should be established as close to the original position as possible and used as an initial starting point for a systematic excavation of soils locally to this area with the exact depth and extent to be determined by the supervising engineer.*
4. ***Provision of 'full radon protection measures':*** *To all plots.*
5. ***Clean capping to soft landscaping areas:*** *600 mm imported clean capping to all soft landscaping areas underlain by either >100 mm crushed quarried stone (Type 1 or similar) or woven geotextile layer. Providing a suitable planting medium for gardens as well as serving as a physical barrier between end users and the underlying Made Ground deposits*

3.0 **Ground Model** – Endline (*Post-Development Condition*) – Profile (*aligned with dip direction of bedrock; presenting an overview of the Remedial Actions)*



Illustrative / conceptual only – do not scale from drawing – note compressed horizontal axis

8.0 Conclusions and Recommendations

8.1 Conclusions

In conclusion, this Controlled Waters Risk Assessment finds that:

> The chemical quality of the soils and groundwater beneath the Site have been degraded by the former industrial use of the Site. The extent to which they have been degraded by sources of potentially polluting material on Site appears to be low.

  This is likely to be largely due to the hydrogeological setting of the Site that is characterised by a continuous, high flux of groundwater passing through the Site that will have resulted in a large proportion of the Site soils having been effectively 'washed' through. The pollution potential of the Site is expected to have been greater historically but, through the passage of time, has diminished to the state it is found today.

  This is not to say the Site has been rendered 'clean' through this action but rather highlights the significance of the groundwater regime.

> Multiple lines of evidence indicate that the chemical quality of the groundwater beneath the Site is primarily controlled by spring-fed discharges on the eastern boundary of the Site within which elevated concentrations of PFAS compounds have been detected. These spring-fed discharges will be collected and discharged to Castle Brook following treatment to levels agreed as part of a Discharge Consent - a key action that represents inherent risk mitigation.

> The risk presented to Controlled Waters is assessed as 'moderate to low'.

  The moderate rating acknowledging:

  a. In having been impacted by PFAS compounds emerging from the spring, the Site's groundwater has itself become 'sources' of PFAS compounds; and,

  b. Concentrations of other chemicals have been recorded at elevated concentrations within the groundwater beneath the Site that have not been linked to the spring water.

> Risk mitigation (remedial work) is recommended to further reduce the risk presented to Controlled Water receptors and achieve a betterment of soil and groundwater quality on the Site and within the wider water catchment.

  With reference to the groundwater regime, this remedial work is focused on reducing the mass of potential pollutants present within the unsaturated zone across the Site (above the groundwater surface) and through this reduce the risk to Controlled Waters.

> Whilst beyond the scope of this Report, the recommended remedial work is linked to, and reduces, the risk to human health both; through the management of PFAS impacted groundwater flows from the spring-line and, directly through a reduction in vapour generating material (removal and off-Site disposal of hydrocarbon impacted soils).

8.2 Recommendations

Recommended follow-on work includes:

1. Review of this Controlled Waters Risk Assessment and the advice herein.
2. Submission of this Controlled Waters Risk Assessment to the Local Planning Authority in support of the discharge of Condition 5 of the outline planning application.
3. Further assessment is not recommended noting that check testing and other fieldworks will be required as part of the recommended remedial works as set out within Soil and Structures' Remediation Strategy presented under separate cover.
4. Planning condition discharge of Parts i) and ii) of Condition 5 of Decision Notice ref. 15/01235/OUT.
5. Risk mitigation is recommended details of which are outlined within Section 6.7 of this Report with full details, including a validation plan, set out within the Soil and Structures' Remediation Strategy presented under separate cover.

8.3 Glossary of Abbreviations

AFFF	**Aqueous Film Forming Foam** (fire suppressant)
BTEX	**Benzene Toluene Ethylbenzene Xylene**
DWS	**Drinking Water Standard**
EQS	**Environmental Quality Standard**
PAH	**Polycyclic Aromatic Hydrocarbons** – 'aromatic' hydrocarbons that are commonly associated with combustion by-products, e.g. soot, dust and exhaust fumes.
PCB	**Polychlorinated Biphenyls** – chemicals now largely banned for use in the UK, commonly used as coolants and electrical insulators within power transmission transformers.
PET	**Polyethylene terephthalate**
PFOA	**Pefluorooctanoic Acid –** one the better studied PFAS compounds with numerous adverse health effects in humans and wildlife. Commonly a breakdown product from the degradation of more complex, precursor PFAS compounds (fluorotelomer-based polymers).
PFAS	**Per and polyfluoroalkyl substances** – the group or 'family' name for millions of chemical compounds that include PFOA, PFOS and PTFE.
PFOS	**Pefluorooctanesulphonic acid** – one the better studied PFAS compounds with numerous adverse health effects in humans and wildlife. Commonly a breakdown product from the degradation of more complex, precursor PFAS compounds (fluorotelomer-based polymers).
PTFE	**Polytetrafluoroethylene** – one of many PFAS compounds commonly referred to as 'forever chemicals' or persistent organic pollutants (POPs). Used alongside other PFAS compounds such as PFOA, PFOS and GenX to create non-stick materials.
PPM	**Parts per million** – a unit of concentration. For liquids this represents milligrams per litre (mg/l)
PPB	**Parts per billion** - a unit of concentration. For liquids this represents micrograms per litre (µg/l)
PPT	**Parts per trillion** - a unit of concentration. For liquids this represents nanograms per litre (ng/l)

Schedule of Accommodation:

Plot	Accommodation	sqm	sqft
1	3 Bedroom House	96	1032
2	3 Bedroom House	96	1032
3	3 Bedroom House	96	1032
4	3 Bedroom House	96	1032
5	3 Bedroom House	96	1032
6	3 Bedroom House	96	1032
7	3 Bedroom House	96	1032
8	3 Bedroom House	96	1032
9	4 Bedroom House	138	1484
10	4 Bedroom House	138	1484
11	4 Bedroom House	218	2346
12	4 Bedroom House	162	1744
13	4 Bedroom House	130	1398
14	4 Bedroom House	130	1398
15	4 Bedroom House	130	1398
16	4 Bedroom House	160	1722
17	4 Bedroom House	180	1937
18	5 Bedroom House	182	1959
19	5 Bedroom House	182	1959
20	5 Bedroom House	182	1959
21	3 Bedroom House	103	1108
22	3 Bedroom House	103	1108
23	5 Bedroom House	260	2800
24	5 Bedroom House	260	2800
25	5 Bedroom House	278	3000

See landscaping plan for full detail for green space

0m 10m 20m 30m 40m 50m

Visual Scale - 1:300

N

materials palette

rainwater goods to be black gutters, downpipes and waste pipes
fascias where applicable to be s/w painted black
doors: composite high security frong and rear entrance doors. Garage doors to be aluminium in finish to match main entrance doors

- Hedge with 1000mm metal wired fence seperating rear gardens
- Low level hedge to front garden
- Grass
- Green space
- Tegular Paviours/setts Vehicle Use
- Tegula Paviours/setts (Pedestrian use Contrasting)
- Tarmac Driveways/parking
- Tarmac Road
- Stone Wall - varies
  - -900mm to front gardens
  - -1000mm high to rear of retaining wall
  - -1800mm when creating a privacy garden wall
- Timber fence
  - -1800mm to plot perimeter
  - -1500mm division to gardens(where hedging not proposed)
- 600mmx600mm Pavers
- Tegula Paviours/setts public footpath
- Pond

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Rev	Date	Description
N	02.12.22	pond changed to engineers drawing
O	06.12.22	Revised to EA comments
P	05.01.23	structual detail infomation included
Q	17.01.23	wall length increased
R	19.01.23	Wall decreased
S	24.01.23	Tim Booth revisions
T	13.02.23	Patio area updated

nicol thomas

architects project managers construction cost consultants CDM co-ordinators
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Client	Mainly Mere
Job	Sladen Mill, Littleborough
Drawing title	Site Layout
Project number	M4856 (PL)02 Rev T
Scale	As indicated@ A1
Date	01/30/23
Drawn by	KS Checked by GRF

13.02.23

SOIL AND STRUCTURES

Key to exploratory hole symbols and abbreviations

SAMPLE TYPES

ACM - Asbestos sample
AMAL - Amalgamated sample
B - Bulk disturbed sample
BLK - Block sample
C - Core sample
CBR - CBR test sample
D - Disturbed sample
ES - Environmental sample
EW - Environmental water sample
G - Gas sample
J - Jar sample
L - Liner sample
TW - Pushed thin wall sample
U - Undisturbed sample
UT - Undisturbed thin wall sample
W - Water sample

IN-SITU TESTS

HV - Hand shear vane
HV(r) - Hand shear vane residual
PID - Photo ionisation detector
PP - Hand penetrometer
SPT - Standard penetration test
SPT(C) - SPT using cone

GROUNDWATER

Groundwater strike

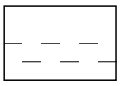
Groundwater rest level

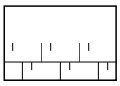
ROTARY CORE DETAILS

TCR - Total core recovery (%)
SCR - Solid core recovery (%)
RQD - Rock quality designation (%)
FI - Fracture index
NI - Non-intact core
AZCL - Assumed zone of core loss

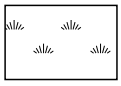
LEGEND

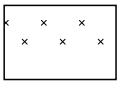
Topsoil

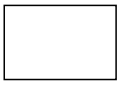
 Clay

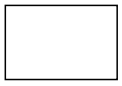
 Chalk

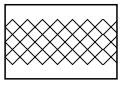
Sand backfill

 Peat

 Silt

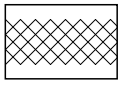
 Breccia

 Gravel backfill

 Made ground

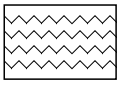
Sand

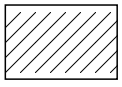
Conglomerate

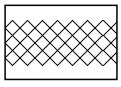
 Arisings

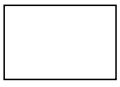
Concrete

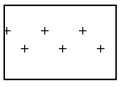
Gravel

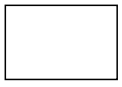
 Metamorphic

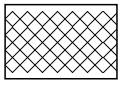
 Bentonite

 Wood

 Cobbles

 Igneous

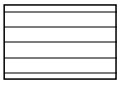
 Concrete

 Brick

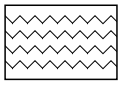
Boulders

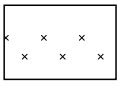
Grout

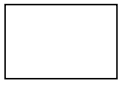
Bituminous material

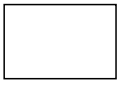
 Mudstone

Plain pipe

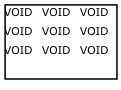
 Gypsum

 Siltstone

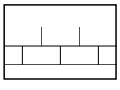
 Coal

 Sandstone

Slotted pipe



Void

 Limestone

Created using Pebble Geo

SOIL AND STRUCTURES

Trial Pit

TP201

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394923.00	417446.00	167.50	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
								Light yellowish and orangish brown locally dark grey and grey, silty, sandy, gravelly, small to large, angular to sub-angular COBBLES of sandstone. Sand is fine to coarse. Gravel is fine to coarse angular to sub-angular sandstone and rare mudstone. [MADE GROUND, REWORKED NATURAL BEDROCK]
		1.50	ES 1			(1.70)		
					165.80	1.70		Grey, dark grey and dark brown, ashy, silty, gravelly, fine to coarse SAND with low cobble content and rare, small to medium (100 mm long) timber fragments. Gravel is fine to coarse angular to sub-rounded sandstone, brick and rare concrete. Cobbles are small to large sub-angular to rounded sandstone and rare concrete and brick. [MADE GROUND, DEMOLITION ARISINGS WITH SUSPECTED ALLUVIAL COBBLES AND BOULDERS]
		3.00	ES 2			(2.10)		
	▼				163.70	3.80		Light yellowish brown with ochre staning, medium strong SANDSTONE recovered as medium to coarse, angular gravel and small, angular cobbles of sandstone. [SANDSTONE, SUSPECTED WOODHEAD HILL ROCK]
						(0.20)		
					163.50	4.00		*End of Trial Pit at 4.00m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting the northern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: Ash present within deeper fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions
0.00 - 4.00m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP201

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394923.00	417446.00	167.50	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client	Contractor	Consultant
Mere Developments Ltd		Soil and Structures Ltd

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
3.80				

Water Strike - Details

Struck (m)	Rose To (m)	Time (mins)	Remarks
3.80	3.80	20	Fast rate, medium volume flows from east to west across base of excavation.

Remarks

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Method, Plant, Stability, Dimensions **Logger**

0.00 - 4.00m TP - Trial Pit 36 tonne tracked RB
Unstable

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP201

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394923.00	417446.00	167.50	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the northern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: Ash present within deeper fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 4.00m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP201

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394923.00	417446.00	167.50	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the northern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: Ash present within deeper fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 4.00m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP201

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394923.00	417446.00	167.50	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the northern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: Ash present within deeper fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 4.00m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP202

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394927.00	417391.00	167.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(1.60)		Grey, dark grey and dark brown, ashy, silty, gravelly, fine to coarse SAND with medium cobble content and medium boulder content. Gravel is fine to coarse angular to sub-rounded sandstone, brick and rare concrete. Cobbles are small to large sub-angular to rounded sandstone and infrequent concrete and brick. Boulders are rounded to sub-rounded sandstone up to 750 mm across. N.B. Fill extends to a depth of 2.20 m on the western edge of the trial pit across which dark grey, weak to medium strong, tabular (thinly to thickly laminated), angular mudstone was recovered - suspected fault-zone / breccia. [MADE GROUND, DEMOLITION ARISINGS WITH SUSPECTED ALLUVIAL COBBLES AND BOULDERS]
		1.50	ES 1					
					166.10	1.60		ON EASTERN SIDE OF TRIAL PIT: Light yellowish and orangish brown, very weak SANDSTONE recovered as very sandy, medium to coarse, angular gravel and small, angular cobbles of sandstone. [SANDSTONE, SUSPECTED WOODHEAD HILL ROCK]
		1.90	ES 2			(0.70)		
	▼				165.40	2.30		*End of Trial Pit at 2.30m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting the western portion of the Site and the location of the highest recorded concentration of PFOA (borehole M4). TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Sidewall collapse througout depth. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. OTHER: Suspected breccia / fault zone - continuous collapse of side-walls limited further excavation/inspection. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions
0.00 - 2.30m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP202

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394927.00	417391.00	167.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client	Contractor	Consultant
Mere Developments Ltd		Soil and Structures Ltd

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
2.20				

Water Strike - Details

Struck (m)	Rose To (m)	Time (mins)	Remarks
2.20	2.20	20	Dampness evident within mudstone deposits towards base of excavation.

Remarks

PURPOSE: Targeting the western portion of the Site and the location of the highest recorded concentration of PFOA (borehole M4). TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Sidewall collapse througout depth. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. OTHER: Suspected breccia / fault zone - continuous collapse of side-walls limited further excavation/inspection. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 2.30m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger

RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP202

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394927.00	417391.00	167.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the western portion of the Site and the location of the highest recorded concentration of PFOA (borehole M4). TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Sidewall collapse througout depth. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. OTHER: Suspected breccia / fault zone - continuous collapse of side-walls limited further excavation/inspection. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 2.30m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP202

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394927.00	417391.00	167.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
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Method, Plant, Stability, Dimensions

0.00 - 2.30m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP202

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394927.00	417391.00	167.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the western portion of the Site and the location of the highest recorded concentration of PFOA (borehole M4). TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Sidewall collapse througout depth. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. OTHER: Suspected breccia / fault zone - continuous collapse of side-walls limited further excavation/inspection. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 2.30m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP202

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394927.00	417391.00	167.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the western portion of the Site and the location of the highest recorded concentration of PFOA (borehole M4). TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Sidewall collapse througout depth. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. OTHER: Suspected breccia / fault zone - continuous collapse of side-walls limited further excavation/inspection. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 2.30m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP203

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394987.00	417404.00	169.70	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
		0.75	ES 1			(1.00)		Light yellowish and orangish brown locally grey and dark brown, slightly silty, sandy, gravelly, small to large, angular to sub-rounded COBBLES of sandstone with low boulder content. Sand is fine to coarse. Gravel is fine to coarse angular to sub-angular sandstone and rare mudstone. Boulders are sub-rounded to rounded sandstone up to 900 mm across. [MADE GROUND, REWORKED NATURAL BEDROCK WITH SUSPECTED ALLUVIAL COBBLES AND BOULDERS]
					168.70	1.00		
						(0.25)		Light yellowish brown with ochre staning, medium strong SANDSTONE recovered as medium to coarse, angular gravel and small, angular cobbles of sandstone. [SANDSTONE, SUSPECTED WOODHEAD HILL ROCK]
					168.45	1.25		*End of Trial Pit at 1.25m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting the eastern portion of the Site and the ground locally to Spring 1. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions
0.00 - 1.25m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.20m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP203

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394987.00	417404.00	169.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client	Contractor	Consultant
Mere Developments Ltd		Soil and Structures Ltd

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
0.30				

Water Strike - Details

Struck (m)	Rose To (m)	Time (mins)	Remarks
0.30	1.20	20	Two distinct medium rate, low volume flow points on eastern face of excavation flowing towards west and te...

Remarks

PURPOSE: Targeting the eastern portion of the Site and the ground locally to Spring 1. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions **Logger**

0.00 - 1.25m TP - Trial Pit 36 tonne tracked RB
Unstable

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP203

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394987.00	417404.00	169.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the eastern portion of the Site and the ground locally to Spring 1. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 1.25m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.20m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP203

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394987.00	417404.00	169.70	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the eastern portion of the Site and the ground locally to Spring 1. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 1.25m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.20m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP204

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	395006.00	417347.00	170.00	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(2.30)		Grey, dark grey and dark brown, slightly silty, very sandy, gravelly, fine to coarse, angular to sub-angular GRAVEL of sandstone, brick and concrete with medium cobble content. Sand is fine to coarse. Cobbles are small to medium angular to sub-angular sandstone and rare concrete and brick. [MADE GROUND, DEMOLITION ARISINGS (SUSPECTED 6F2)]
		1.50	ES 1					
					167.70	2.30		
	▼	2.50	ES 2			(0.30)		Light yellowish brown with ochre staning, weak to very weak SANDSTONE recovered as very sandy, medium to coarse, angular gravel and small, angular cobbles of sandstone. [SANDSTONE, SUSPECTED WOODHEAD HILL ROCK]
					167.40	2.60		*End of Trial Pit at 2.60m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting the southern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey - TREAT WITH CAUTION - level changes across this portion of the Site.

Method, Plant, Stability, Dimensions
0.00 - 2.60m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.60m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

Created using Pebble Geo

SOIL AND STRUCTURES

Trial Pit

TP204

SUPPLEMENTARY INFO

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	395006.00	417347.00	170.00	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client	Contractor	Consultant
Mere Developments Ltd		Soil and Structures Ltd

Water Strike - General

Struck (m)	Seal Depth (m)	Casing Depth (m)	Date and Time	Remarks
2.50				

Water Strike - Details

Struck (m)	Rose To (m)	Time (mins)	Remarks
2.50	2.50	20	Medium rate, medium volume flows from east to west across base of excavation.

Remarks

PURPOSE: Targeting the southern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey - TREAT WITH CAUTION - level changes across this portion of the Site.

Method, Plant, Stability, Dimensions **Logger**

0.00 - 2.60m TP - Trial Pit 36 tonne tracked RB
Unstable
L = 2.60m
W = 1.20m

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP204

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	395006.00	417347.00	170.00	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the southern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey - TREAT WITH CAUTION - level changes across this portion of the Site.

Method, Plant, Stability, Dimensions

0.00 - 2.60m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.60m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP204

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	395006.00	417347.00	170.00	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the southern portion of the Site and former reservoir. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: East to west basal flows. STABILITY: Spalling througout depth. OTHER: No evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey - TREAT WITH CAUTION - level changes across this portion of the Site.

Method, Plant, Stability, Dimensions **Logger**

0.00 - 2.60m TP - Trial Pit 36 tonne tracked RB
Unstable
L = 2.60m
W = 1.20m

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP205

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394969.00	417434.00	177.00	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
						(0.20)		Black, bound bitumenous gravel over light whitish grey medium to coarse GRAVEL of limestone (SUB-BASE). [MADE GROUND, HARDSTANDING]
					176.80	0.20		Brown, dark brown and light yellowish brown, ashy, slightly silty, gravelly, fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to sub-rounded sandstone, brick and infrequent amorphous clinker. Cobbles are small to large sub-angular to rounded sandstone and rare concrete and brick. [MADE GROUND, DEMOLITION ARISINGS WITH REWORKED NATURAL BEDROCK]
						(1.40)		
		1.60	ES 1		175.40	1.60		Light yellowish brown with ochre staning, extremely weak to weak SANDSTONE recovered as very sandy, medium to coarse, angular gravel and small, angular cobbles of sandstone. [SANDSTONE, SUSPECTED WOODHEAD HILL ROCK]
						(0.80)		
		2.40	ES 2		174.60	2.40		*End of Trial Pit at 2.40m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting the upper portion of the Site. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: None encountered. STABILITY: Localised spalling in the Made Ground. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions
0.00 - 2.40m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.60m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP205

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	394969.00	417434.00	177.00	1:25

Project Name	Project No.	Start Date	End Date
Sladen Mill, Littleborough	20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the upper portion of the Site. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: None encountered. STABILITY: Localised spalling in the Made Ground. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 2.40m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.60m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP206

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	395007.00	417406.00	178.25	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Samples and Tests: Type/ Ref	Samples and Tests: Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Strata: Description
								Dark grey and dark brown SAND and GRAVEL of ash and clinker. Sand is fine to coarse. Gravel is fine to medium amorphous clinker and infrequent angular brick. [MADE GROUND, RESERVOIR FILL]
								Sandstone wall in side-wall of excavation formed of sub-angular large sandstone cobbles. (0.30 - 1.00m)
						(1.20)		
		1.00	ES 1					
					177.05	1.20		Light greyish brown slightly sandy, slightly gravelly CLAY with soft consistency. Sand is fine to coarse. Gravel is fine to coarse, angular to sub-rounded sandstone and infrequent brick. [MADE GROUND, RESERVOIR FILL]
						(0.80)		
					176.25	2.00		
						(0.10)		Dark greyish brown organic SILT with psuedofiberous organic content. [SUSPECTED ALLUVIUM, SUSPECTED RESERVOIR BASE]
					176.15	2.10		
						(0.10)		Light whitish grey slightly clayey slightly sandy SILT. Sand is fine to medium. [SUSPECTED ALLUVIUM, SUSPECTED RESERVOIR BASE. POSSIBLE 'PUDDLE CLAY']
					176.05	2.20		
								Light yellowish brown with ochre staning, extremely weak to weak SANDSTONE recovered as very sandy, medium to coarse, angular gravel and small, angular cobbles of sandstone. [SANDSTONE, SUSPECTED WOODHEAD HILL ROCK]
						(0.70)		
		2.60	ES 2					
					175.35	2.90		*End of Trial Pit at 2.90m*

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Remarks
PURPOSE: Targeting the upper portion of the Site, the former reservoir and ground up-gradient of Spring 1. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: None encountered. STABILITY: Localised spalling in the Made Ground. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions
0.00 - 2.90m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP206

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	395007.00	417406.00	178.25	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the upper portion of the Site, the former reservoir and ground up-gradient of Spring 1. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: None encountered. STABILITY: Localised spalling in the Made Ground. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 2.90m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

SOIL AND STRUCTURES

Trial Pit

TP206

PHOTO PAGE

Hole Type	Easting	Northing	Ground Level (m)	Scale
TP	395007.00	417406.00	178.25	1:25
Project Name		**Project No.**	**Start Date**	**End Date**
Sladen Mill, Littleborough		20403	2024-10-10	2024-10-10

Client
Mere Developments Ltd

Contractor

Consultant
Soil and Structures Ltd

Remarks
PURPOSE: Targeting the upper portion of the Site, the former reservoir and ground up-gradient of Spring 1. TERMINATION: Practical refusal of 36 tonne excavator with toothed bucket on intact bedrock. GROUNDWATER: None encountered. STABILITY: Localised spalling in the Made Ground. OTHER: Ash present within fill but otherwise no evidence of potentially polluting or harmful material. LOCATION: Referenced using free-ware on Site. GL: Estimated off May 2021 topographical survey.

Method, Plant, Stability, Dimensions

0.00 - 2.90m TP - Trial Pit 36 tonne tracked
Unstable
L = 2.80m
W = 1.20m

Logger
RB

Checked By: RB **Approved By:** RB **Status:** FINAL

TP301

TP301

TP301

TP301

TP301

TP301 (relative to TP206 in foreground)

TP302

TP302

TP302

TP303

TP303

TP303

TP303

TP304

TP305

TP305

TP306

TP306

TP307

TP308

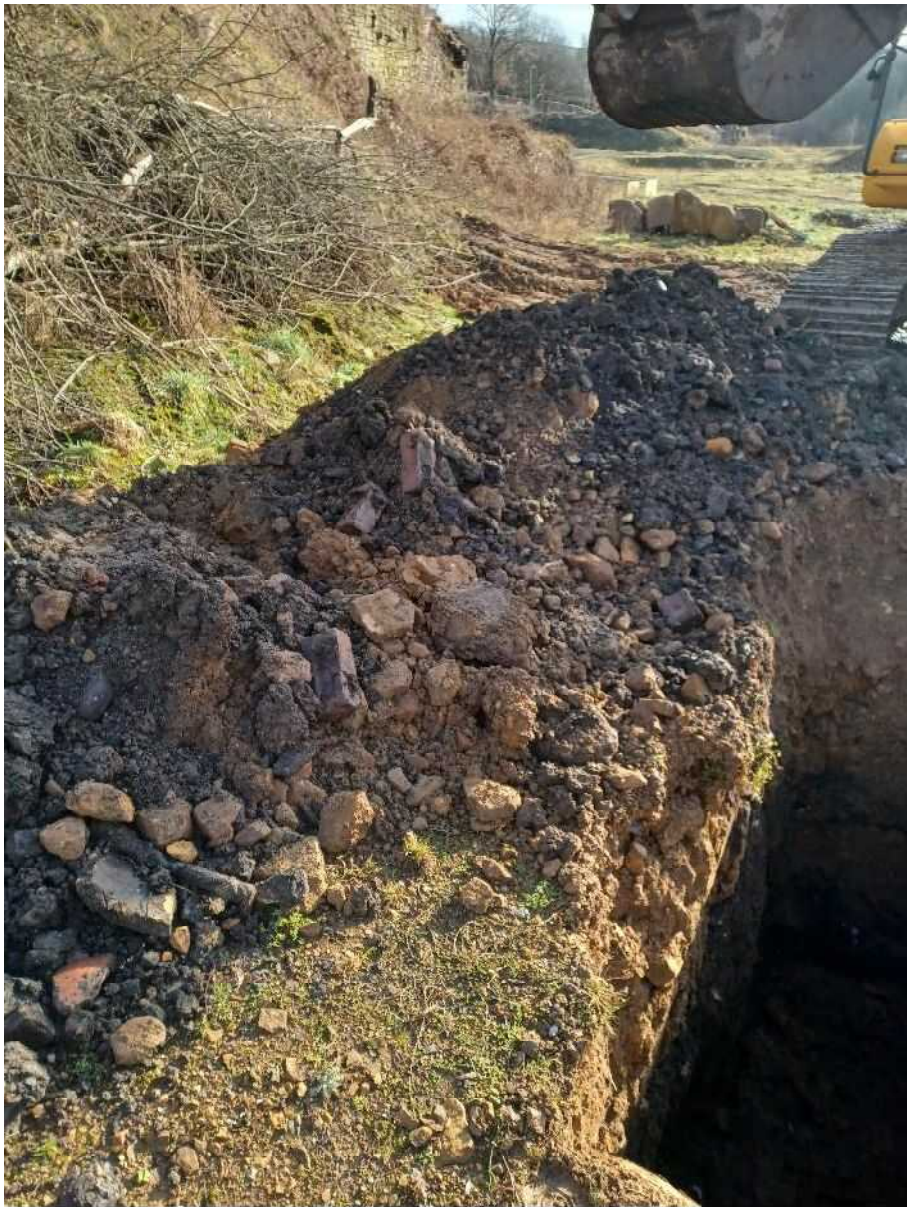
TP308

TP309

TP309

TP309

TP310



TP310

TP311

TP311

TP311 – Sprin line in burried rockface

TP312

TP312

TP313

TP315

TP315

TP316 – seepage flow of water from eastern edge of pit – towards PFAS impacted spring water

TP316 PFAS impacted spring water (overland flows) present at top of image

TP317 – cobble bed towards base of hole

TP317 – alluvial / river terrace cobbles in arisings

TP318 – cobble bed throughout depth of hole

TP318 – cobbles in arisings

TP319

TP319

TP319 – sandstone bedrock at base of hole

Spring 4 location

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Soil and Structures Ltd
89 Moorhead Lane
Shipley
West Yorkshire
BD18 4JW

Attention: Russell Bowman

CERTIFICATE OF ANALYSIS

Date of report Generation:	25 November 2024
Customer:	Soil and Structures Ltd
Sample Delivery Group (SDG):	241012-71
Your Reference:	
Location:	Sladen Mill
Report No:	748012
Order Number:	

This report has been revised and directly supersedes 747601 in its entirety.

We received 13 samples on Saturday October 12, 2024 and 13 of these samples were scheduled for analysis which was completed on Monday November 25, 2024. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Lauren Ellis
General Manager Western Europe Environmental

CERTIFICATE OF ANALYSIS

SDG: 241012-71 Report Number: 748012 Superseded Report: 747601
Client Ref.: Location: Sladen Mill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
30510932	SPRING 1			10/10/2024
30510933	TB			10/10/2024
30510934	TP201		1.50	10/10/2024
30510935	TP201		3.00	10/10/2024
30510936	TP202		1.50	10/10/2024
30510938	TP202		2.00	10/10/2024
30510940	TP203		0.75	10/10/2024
30510941	TP204		1.50	10/10/2024
30510942	TP204		2.50	10/10/2024
30510943	TP205		1.00	10/10/2024
30510945	TP205		2.20	10/10/2024
30510946	TP206		1.00	10/10/2024
30510947	TP206		2.60	10/10/2024

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601
Client Ref.: **Location:** Sladen Mill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			30510932	SPRING 1			Digitube fo PFAS analysis.	GW
			30510933	TB			1kg TUB with Handle (ALE260)	S
			30510934	TP201		1.50	1kg TUB with Handle (ALE260)	S
			30510935	TP201		3.00	1kg TUB with Handle (ALE260)	S
			30510936	TP202		1.50	1kg TUB with Handle (ALE260)	S
			30510938	TP202		2.00	1kg TUB with Handle (ALE260)	S
			30510940	TP203		0.75	1kg TUB with Handle (ALE260)	S
			30510941	TP204		1.50	1kg TUB with Handle (ALE260)	S
			30510942	TP204		2.50	1kg TUB with Handle (ALE260)	S
			30510943	TP205		1.00	1kg TUB with Handle (ALE260)	S
			30510945	TP205		2.20	1kg TUB with Handle (ALE260)	S
			30510946	TP206		1.00	1kg TUB with Handle (ALE260)	S
			30510947	TP206		2.60	1kg TUB with Handle (ALE260)	S
PFAS (Post Ox.) Liquids	All	NDPs: 0 Tests: 1	X					
PFAS (Post Ox.) Solids	All	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X
PFAS Liquids (Full Suite)	All	NDPs: 0 Tests: 1	X					
PFAS Solids	All	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG: 241012-71 Report Number: 748012 Superseded Report: 747601
Client Ref.: Location: Sladen Mill

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
30510933	TB		Cream	Sand	None	None
30510934	TP201	1.50	Dark Brown	Sandy Clay Loam	Stones	Vegetation
30510935	TP201	3.00	Dark Brown	Loamy Sand	Stones	Vegetation
30510936	TP202	1.50	Dark Brown	Sandy Clay Loam	Stones	Brick
30510938	TP202	2.00	Light Brown	Sandy Clay Loam	Stones	None
30510940	TP203	0.75	Light Brown	Loamy Sand	Stones	None
30510941	TP204	1.50	Dark Brown	Sandy Clay Loam	Stones	Brick
30510942	TP204	2.50	Dark Brown	Sandy Clay Loam	Stones	None
30510943	TP205	1.00	Dark Brown	Sand	Stones	None
30510945	TP205	2.20	Light Brown	Sand	Stones	None
30510946	TP206	1.00	Black	Sand	Stones	Crushed Brick
30510947	TP206	2.60	Light Brown	Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4♦§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SPRING 1	TB	TP201	TP201	TP202	TP202
			Depth (m)	.	.	1.50	3.00	1.50	2.00
			Sample Type	Ground Water (GW)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024
			Sample Time	.	.	.	.	.	.
			Date Received	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024
			SDG Ref	241012-71	241012-71	241012-71	241012-71	241012-71	241012-71
			Lab Sample No.(s)	30510932	30510933	30510934	30510935	30510936	30510938
			AGS Reference						
PFBA (Post Ox.) (375-22-4)	<4 ng/l	TM405		<20					
PFPA (Post Ox.) (2706-90-3)	<2 ng/l	TM405		<10					
PFHxA (Post Ox.) (307-24-4)	<2 ng/l	TM405		37					
PFBS (Post Ox.) (375-73-5)	<2 ng/l	TM405		<10					
PFHpA (Post Ox.) (375-85-9)	<2 ng/l	TM405		68					
6:2 FTS (Post Ox.) (27619-97-2)	<2 ng/l	TM405		<10					
PFOA (Post Ox.) (335-67-1)	<2 ng/l	TM405		3010					
PFHxS (Post Ox.) (355-46-4)	<2 ng/l	TM405		<10					
PFNA (Post Ox.) (375-95-1)	<2 ng/l	TM405		<10					
PFHpS (Post Ox.) (375-92-8)	<2 ng/l	TM405		<10					
PFDA (Post Ox.) (335-76-2)	<2 ng/l	TM405		<10					
Linear PFOS (Post Ox.) (1763-23-1)	<2 ng/l	TM405		<10					
Branched PFOS (Post Ox.)	<2 ng/l	TM405		<10					
PFUnA (Post Ox.) (2058-94-8)	<2 ng/l	TM405		<10					
PFDoA (Post Ox.) (307-55-1)	<2 ng/l	TM405		<10					
PFOSA (Post Ox.) (754-91-6)	<4 ng/l	TM405		<20					
PFDS (Post Ox.) (335-77-3)	<2 ng/l	TM405		<10					
PFPeS (Post Ox.) (2706-91-4)	<2 ng/l	TM405		<10					
Total PFOS (Post Ox.)	<2 ng/l	TM405		<10					
PFBA (375-22-4)	<2 ng/l	TM434		4.63 @ #					
PFPA (2706-90-3)	<1 ng/l	TM434		5.32 @ #					
PFBS (375-73-5)	<1 ng/l	TM434		1.6 @ #					
PFHxA (307-24-4)	<1 ng/l	TM434		30.5 @ #					
PFHpA (375-85-9)	<1 ng/l	TM434		58.6 @ #					
PFPeS (2706-91-4)	<1 ng/l	TM434		<1 @ #					
6:2 FTS (27619-97-2)	<1 ng/l	TM434		<1 @ #					
PFOA (335-67-1)	<0.65 ng/l	TM434		1190 @ #					
PFHxS (355-46-4)	<1 ng/l	TM434		1.15 @ #					
PFNA (375-95-1)	<1 ng/l	TM434		<1 @ #					
PFHpS (375-92-8)	<1 ng/l	TM434		<1 @ #					
PFDA (335-76-2)	<2 ng/l	TM434		<2 @ #					
Linear PFOS (1763-23-1)	<0.65 ng/l	TM434		1.59 @ #					
Branched PFOS	<0.65 ng/l	TM434		2.09 @ #					

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601
Client Ref.: **Location:** Sladen Mill

Results Legend
ISO17025 accredited.
M mCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SPRING 1	TB	TP201	TP201	TP202	TP202
			Depth (m)	.	.	1.50	3.00	1.50	2.00
			Sample Type	Ground Water (GW)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024
			Sample Time	.	.	.	.	.	.
			Date Received	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024
			SDG Ref	241012-71	241012-71	241012-71	241012-71	241012-71	241012-71
			Lab Sample No.(s)	30510932	30510933	30510934	30510935	30510936	30510938
			AGS Reference						
PFUnA (2058-94-8)	<2 ng/l	TM434		<2 @ #					
PFDoA (307-55-1)	<2 ng/l	TM434		<2 @ #					
PFDS (335-77-3)	<2 ng/l	TM434		<2 @ #					
PFOSA (754-91-6)	<2 ng/l	TM434		<2 @ #					
Total PFOS	<0.65 ng/l	TM434		3.68 @ #					
Moisture Content Ratio (% of as received sample)	%	PM024			0	9.4	17	17	15
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338			<3	<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338			<3	<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338			<2	<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338			<1	<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338			<1	<1	<1	<1	<1
Branched PFOS	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338			<1	<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338			<1	<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338			<1	<1	<1	<1	<1
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428			<3	<3	<3	<3	<3
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428			<3	<3	<3	<3	<3
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428			<2	<2	<2	<2	<2
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428			<1	<1	<1	<1	<1
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428			<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601

Client Ref.: **Location:** Sladen Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SPRING 1	TB	TP201	TP201	TP202	TP202
			Depth (m)	.	.	1.50	3.00	1.50	2.00
			Sample Type	Ground Water (GW)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024
			Sample Time	.	.	.	.	.	.
			Date Received	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024
			SDG Ref	241012-71	241012-71	241012-71	241012-71	241012-71	241012-71
			Lab Sample No.(s)	30510932	30510933	30510934	30510935	30510936	30510938
			AGS Reference						
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428			<1	<1	<1	<1	<1
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428			<1	<1	<1	<1	<1
Branched PFOS (Post Ox.)	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428			<1	<1	<1	<1	<1
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428			<1	<1	<1	<1	<1
Total PFOS (Post Ox.)	<2 µg/kg	TM428			<2	<2	<2	<2	<2

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601
Client Ref.: **Location:** Sladen Mill

Results Legend
ISO17025 accredited.
M mCERTS accredited.
aq Aqueous / settled sample.
diss.filt Dissolved / filtered sample.
tot.unfilt Total / unfiltered sample.
* Subcontracted - refer to subcontractor report for accreditation status.
** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F) Trigger breach confirmed
1-4+§@ Sample deviation (see appendix)

Customer Sample Ref.	TP203	TP204	TP204	TP205	TP205	TP206
Depth (m)	0.75	1.50	2.50	1.00	2.20	1.00
Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024
Sample Time	.	.	.	.	.	.
Date Received	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024
SDG Ref	241012-71	241012-71	241012-71	241012-71	241012-71	241012-71
Lab Sample No.(s)	30510940	30510941	30510942	30510943	30510945	30510946
AGS Reference						

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	10	13	11	10	16	21
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338	<3	<3	<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338	<3	<3	<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338	<2	<2	<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	27.5
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
Branched PFOS	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428	<3	<3	<3	<3	<3	<3
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428	<3	<3	<3	<3	<3	<3
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428	<2	<2	<2	<2	<2	<2
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1
Branched PFOS (Post Ox.)	<1 µg/kg	TM428	<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP203	TP204	TP204	TP205	TP205	TP206
			Depth (m)	0.75	1.50	2.50	1.00	2.20	1.00
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024
			Sample Time	.	.	.	.	.	.
			Date Received	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024	12/10/2024
			SDG Ref	241012-71	241012-71	241012-71	241012-71	241012-71	241012-71
			Lab Sample No.(s)	30510940	30510941	30510942	30510943	30510945	30510946
			AGS Reference						
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428		<1	<1	<1	<1	<1	<1
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428		<1	<1	<1	<1	<1	<1
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428		<1	<1	<1	<1	<1	<1
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428		<1	<1	<1	<1	<1	<1
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428		<1	<1	<1	<1	<1	<1
Total PFOS (Post Ox.)	<2 µg/kg	TM428		<2	<2	<2	<2	<2	<2

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601
Client Ref.: **Location:** Sladen Mill

Results Legend		
#	ISO17025 accredited.	
M	mCERTS accredited.	
aq	Aqueous / settled sample.	
diss.filt	Dissolved / filtered sample.	
tot.unfilt	Total / unfiltered sample.	
*	Subcontracted - refer to subcontractor report for accreditation status.	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	
(F)	Trigger breach confirmed	
1-4+$@	Sample deviation (see appendix)	

Component	LOD/Units	Method	Customer Sample Ref.					
			TP206					
Depth (m)			2.60					
Sample Type			Soil/Solid (S)					
Date Sampled			10/10/2024					
Sample Time			.					
Date Received			12/10/2024					
SDG Ref			241012-71					
Lab Sample No.(s)			30510947					
AGS Reference								
Moisture Content Ratio (% of as received sample)	%	PM024	11					
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338	<3					
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338	<3					
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338	<2					
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338	<1					
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338	<1					
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338	<1					
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338	<1					
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338	<1					
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338	<1					
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338	<1					
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338	<1					
Branched PFOS	<1 µg/kg	TM338	<1					
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338	<1					
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338	<1					
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338	<1					
6:2-FTS (27619-97-2)	<1 µg/kg	TM338	<1					
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338	<1					
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338	<1					
Total PFOS	<1 µg/kg	TM338	<1					
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428	<3					
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428	<3					
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428	<2					
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428	<1					
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428	<1					
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428	<1					
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428	<1					
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428	<1					
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428	<1					
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428	<1					
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428	<1					
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428	<1					
Branched PFOS (Post Ox.)	<1 µg/kg	TM428	<1					

Validated

CERTIFICATE OF ANALYSIS

SDG: 241012-71 **Report Number:** 748012 **Superseded Report:** 747601

Client Ref.: **Location:** Sladen Mill

Results Legend		Customer Sample Ref.	TP206
#	ISO17025 accredited.		
M	mCERTS accredited.		
aq	Aqueous / settled sample.		
diss.filt	Dissolved / filtered sample.		
tot.unfilt	Total / unfiltered sample.		
*	Subcontracted - refer to subcontractor report for accreditation status.		
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		
(F)	Trigger breach confirmed		
1-4+§@	Sample deviation (see appendix)		
		Depth (m)	2.60
		Sample Type	Soil/Solid (S)
		Date Sampled	10/10/2024
		Sample Time	.
		Date Received	12/10/2024
		SDG Ref	241012-71
		Lab Sample No.(s)	30510947
		AGS Reference	

Component	LOD/Units	Method	
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428	<1
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428	<1
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428	<1
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428	<1
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428	<1
Total PFOS (Post Ox.)	<2 µg/kg	TM428	<2

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture, screens of soils for Asbestos Containing Material
TM405	Analysis of perfluoroalkylsulfonates and perfluorocarboxylic acids - Total Oxidizable Precursor Assay
TM338	Analysis of perfluoroalkylsulfonates and perfluorocarboxylic acids in Solids
TM434	Analysis of PFAS
TM428	Analysis of perfluoroalkylsulfonates and perfluorocarboxylic acids - Total Oxidizable Precursor Assay

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

Test Completion Dates

Lab Sample No(s)	30510932	30510933	30510934	30510935	30510936	30510938	30510940	30510941	30510942	30510943
Customer Sample Ref.	SPRING 1	TB	TP201	TP201	TP202	TP202	TP203	TP204	TP204	TP205
AGS Ref.										
Depth			1.50	3.00	1.50	2.00	0.75	1.50	2.50	1.00
Type	Ground Water	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PFAS (Post Ox.) Liquids	07-Nov-2024									
PFAS (Post Ox.) Solids		24-Oct-2024	24-Oct-2024	24-Oct-2024	24-Oct-2024	25-Nov-2024	24-Oct-2024	24-Oct-2024	03-Nov-2024	24-Oct-2024
PFAS Liquids (Full Suite)	21-Nov-2024									
PFAS Solids		24-Oct-2024	24-Oct-2024	24-Oct-2024	24-Oct-2024	24-Oct-2024	24-Oct-2024	24-Oct-2024	24-Oct-2024	24-Oct-2024
Sample description		17-Oct-2024	17-Oct-2024	17-Oct-2024	17-Oct-2024	16-Oct-2024	16-Oct-2024	16-Oct-2024	17-Oct-2024	17-Oct-2024

Lab Sample No(s)	30510945	30510946	30510947
Customer Sample Ref.	TP205	TP206	TP206
AGS Ref.			
Depth	2.20	1.00	2.60
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PFAS (Post Ox.) Solids	24-Oct-2024	06-Nov-2024	24-Oct-2024
PFAS Solids	24-Oct-2024	30-Oct-2024	24-Oct-2024
Sample description	17-Oct-2024	17-Oct-2024	17-Oct-2024

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Soil and Structures Ltd
89 Moorhead Lane
Shipley
West Yorkshire
BD18 4JW

Attention: Russell Bowman

CERTIFICATE OF ANALYSIS

Date of report Generation:	18 February 2025
Customer:	Soil and Structures Ltd
Sample Delivery Group (SDG):	250205-38
Your Reference:	
Location:	Sladen Mill
Report No:	756610
Order Number:	

This report has been revised and directly supersedes 756601 in its entirety.

We received 44 samples on Wednesday February 05, 2025 and 42 of these samples were scheduled for analysis which was completed on Tuesday February 18, 2025. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Justin Keeton
Business Unit Leader - Land

1291

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
31031045	SPRING 3			03/02/2025
31031046	SPRING 4			03/02/2025
31031005	TP301		0.50	03/02/2025
31031006	TP301		1.00	03/02/2025
31031007	TP301		2.00	03/02/2025
31031008	TP302		0.25	03/02/2025
31031009	TP302		1.00	03/02/2025
31031010	TP302		1.50	03/02/2025
31031011	TP303		0.25	03/02/2025
31031012	TP303		1.00	03/02/2025
31031013	TP303		1.50	03/02/2025
31031014	TP304		0.75	03/02/2025
31031015	TP304		1.50	03/02/2025
31031016	TP305		0.50	03/02/2025
31031017	TP305		1.10	03/02/2025
31031018	TP306		0.25	03/02/2025
31031019	TP306		0.75	03/02/2025
31031020	TP307		0.25	03/02/2025
31031021	TP307		0.50	03/02/2025
31031022	TP308		0.25	03/02/2025
31034853	TP308		0.50	03/01/2025
31031023	TP309		0.50	03/02/2025
31031024	TP309		1.50	03/02/2025
31031025	TP310		0.25	03/02/2025
31031026	TP310		1.00	03/02/2025
31031027	TP310		2.00	03/02/2025
31031028	TP312		0.50	03/02/2025
31031029	TP312		1.00	03/02/2025
31031030	TP312		1.50	03/02/2025
31031031	TP313		0.25	03/02/2025
31031032	TP313		0.75	03/02/2025
31031033	TP314		0.50	03/02/2025
31031034	TP315		0.25	03/02/2025
31031035	TP316		0.50	03/02/2025
31031036	TP316		1.00	03/02/2025
31031037	TP317		0.25	03/02/2025
31031038	TP317		0.75	03/02/2025
31031039	TP317		1.25	03/02/2025
31031040	TP318		0.30	03/02/2025
31031041	TP318		0.60	03/01/2025
31031042	TP318		0.90	03/02/2025
31031043	TP319		0.50	03/02/2025
31031044	TP319		1.50	03/02/2025
31031047	UPSTREAM			03/02/2025

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	31031045	31031046	31031005	31031006	31031007	31031008	31031009	31031010	31031011	31031012	31031013	31031014	31031015	31031016	31031017	31031018	31031019	31031020	31031021
			Customer Sample Reference	SPRING 3	SPRING 4	TP301	TP301	TP301	TP302	TP302	TP302	TP303	TP303	TP303	TP304	TP304	TP305	TP305	TP306	TP306	TP307	TP307
			AGS Reference																			
			Depth (m)			0.50	1.00	2.00	0.25	1.00	1.50	0.25	1.00	1.50	0.75	1.50	0.50	1.10	0.25	0.75	0.25	0.50
			Container	500ml Plastic (ALE208)	500ml Plastic (ALE208)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)
			Sample Type	GW	GW	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
PFAS (Post Ox.) Solids	All	NDPs: 0 Tests: 12					X		X				X		X		X			X		
PFAS Liquids (Full Suite)	All	NDPs: 0 Tests: 3		X	X																	
PFAS Solids	All	NDPs: 0 Tests: 39				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 39				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

31031043	TP319		0.50	1kg TUB with Handle (ALE260)	S				X	X	X
31031042	TP318		0.90	1kg TUB with Handle (ALE260)	S				X	X	X
31031041	TP318		0.60	1kg TUB with Handle (ALE260)	S		X		X	X	X
31031040	TP318		0.30	1kg TUB with Handle (ALE260)	S				X	X	X
31031037	TP317		0.25	1kg TUB with Handle (ALE260)	S				X	X	X
31031036	TP316		1.00	1kg TUB with Handle (ALE260)	S				X	X	X
31031035	TP316		0.50	1kg TUB with Handle (ALE260)	S		X		X	X	X
31031034	TP315		0.25	1kg TUB with Handle (ALE260)	S				X	X	X
31031033	TP314		0.50	1kg TUB with Handle (ALE260)	S				X	X	X
31031032	TP313		0.75	1kg TUB with Handle (ALE260)	S				X	X	X
31031031	TP313		0.25	1kg TUB with Handle (ALE260)	S				X	X	X
31031030	TP312		1.50	1kg TUB with Handle (ALE260)	S				X	X	X
31031029	TP312		1.00	1kg TUB with Handle (ALE260)	S		X		X	X	X
31031028	TP312		0.50	1kg TUB with Handle (ALE260)	S				X	X	X
31031027	TP310		2.00	1kg TUB with Handle (ALE260)	S				X	X	X
31031026	TP310		1.00	1kg TUB with Handle (ALE260)	S				X	X	X
31031025	TP310		0.25	1kg TUB with Handle (ALE260)	S				X	X	X
31031024	TP309		1.50	1kg TUB with Handle (ALE260)	S		X		X	X	X
31031023	TP309		0.50	1kg TUB with Handle (ALE260)	S				X	X	X
31034853	TP308		0.50	1kg TUB with Handle (ALE260)	S				X	X	X
31031022	TP308		0.25	1kg TUB with Handle (ALE260)	S		X		X	X	X

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	31031044	31031047
			Customer Sample Reference	TP319	UPSTREAM
			AGS Reference		
			Depth (m)	1.50	
			Container	1kg TUB with Handle (ALE260)	500ml Plastic (ALE208)
			Sample Type	S	SW
PFAS (Post Ox.) Solids	All	NDPs: 0 Tests: 12		X	
PFAS Liquids (Full Suite)	All	NDPs: 0 Tests: 3			X
PFAS Solids	All	NDPs: 0 Tests: 39		X	
Sample description	All	NDPs: 0 Tests: 39		X	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
31031005	TP301	0.50	Dark Brown	Sand	Stones	None
31031006	TP301	1.00	Black	Sand	Stones	None
31031007	TP301	2.00	Dark Brown	Loamy Sand	Stones	None
31031008	TP302	0.25	Black	Sand	Stones	None
31031009	TP302	1.00	Dark Brown	Sand	None	None
31031010	TP302	1.50	Dark Brown	Loamy Sand	Stones	None
31031011	TP303	0.25	Dark Brown	Loamy Sand	Stones	None
31031012	TP303	1.00	Black	Sand	None	None
31031013	TP303	1.50	Dark Brown	Sand	Stones	None
31031014	TP304	0.75	Black	Sand	Stones	None
31031015	TP304	1.50	Dark Brown	Sand	Stones	None
31031016	TP305	0.50	Dark Brown	Sandy Loam	Stones	Crushed Brick
31031017	TP305	1.10	Dark Brown	Sand	Stones	None
31031018	TP306	0.25	Dark Brown	Sand	Stones	Vegetation
31031019	TP306	0.75	Dark Brown	Sand	Stones	None
31031020	TP307	0.25	Black	Sand	Stones	Vegetation
31031021	TP307	0.50	Dark Brown	Sand	Stones	None
31031022	TP308	0.25	Dark Brown	Sandy Loam	Stones	Crushed Brick
31034853	TP308	0.50	Dark Brown	Sandy Loam	Stones	None
31031023	TP309	0.50	Dark Brown	Sandy Loam	Stones	None
31031024	TP309	1.50	Dark Brown	Sandy Loam	Stones	Vegetation
31031025	TP310	0.25	Dark Brown	Sandy Loam	Stones	None
31031026	TP310	1.00	Dark Brown	Loamy Sand	Stones	Vegetation
31031027	TP310	2.00	Black	Sand	Stones	None
31031028	TP312	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
31031029	TP312	1.00	Dark Brown	Sandy Loam	Stones	Glass
31031030	TP312	1.50	Dark Brown	Sandy Loam	Stones	Vegetation
31031031	TP313	0.25	Dark Brown	Sandy Loam	Stones	Vegetation
31031032	TP313	0.75	Dark Brown	Sandy Clay Loam	Stones	Vegetation
31031033	TP314	0.50	Light Brown	Loamy Sand	Stones	Vegetation
31031034	TP315	0.25	Dark Brown	Sand	Stones	Crushed Brick
31031035	TP316	0.50	Dark Brown	Sand	Stones	None
31031036	TP316	1.00	Dark Brown	Loamy Sand	Stones	Vegetation
31031037	TP317	0.25	Dark Brown	Sandy Loam	Stones	Vegetation
31031040	TP318	0.30	Dark Brown	Sand	Stones	None
31031041	TP318	0.60	Dark Brown	Sandy Loam	Stones	Vegetation
31031042	TP318	0.90	Dark Brown	Loamy Sand	Stones	None
31031043	TP319	0.50	Dark Brown	Sandy Loam	Stones	Brick
31031044	TP319	1.50	Dark Brown	Sandy Clay Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601

Client Ref.: **Location:** Sladen Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SPRING 3	SPRING 4	TP301	TP301	TP301	TP302
			Depth (m)	.	.	0.50	1.00	2.00	0.25
			Sample Type	Ground Water (GW)	Ground Water (GW)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031045	31031046	31031005	31031006	31031007	31031008
			AGS Reference						
PFBA (375-22-4)	<2 ng/l	TM434		<4 2 #	<4 2 #				
PFPA (2706-90-3)	<1 ng/l	TM434		2.11 2 #	<2 2 #				
PFBS (375-73-5)	<1 ng/l	TM434		19 2 #	<2 2 #				
PFHxA (307-24-4)	<1 ng/l	TM434		6.66 2 #	2.41 2 #				
PFHpA (375-85-9)	<1 ng/l	TM434		7.76 2 #	3.78 2 #				
PFPeS (2706-91-4)	<1 ng/l	TM434		<2 2 #	<2 2 #				
6:2 FTS (27619-97-2)	<1 ng/l	TM434		<2 2 #	2.45 2 #				
PFOA (335-67-1)	<0.65 ng/l	TM434		294 2 #	108 2 #				
PFHxS (355-46-4)	<1 ng/l	TM434		<2 2 #	<2 2 #				
PFNA (375-95-1)	<1 ng/l	TM434		<2 2 #	<2 2 #				
PFHpS (375-92-8)	<1 ng/l	TM434		<2 2 #	<2 2 #				
PFDA (335-76-2)	<2 ng/l	TM434		<4 2 #	<4 2 #				
Linear PFOS (1763-23-1)	<0.65 ng/l	TM434		<1.3 2 #	<1.3 2 #				
Branched PFOS	<0.65 ng/l	TM434		2.15 2 #	<1.3 2 #				
PFUnA (2058-94-8)	<2 ng/l	TM434		<4 2 #	<4 2 #				
PFDoA (307-55-1)	<2 ng/l	TM434		<4 2 #	<4 2 #				
PFDS (335-77-3)	<2 ng/l	TM434		<4 2 #	<4 2 #				
PFOSA (754-91-6)	<2 ng/l	TM434		<4 2 #	<4 2 #				
Total PFOS	<0.65 ng/l	TM434		2.15 2 #	<1.3 2 #				
Moisture Content Ratio (% of as received sample)	%	PM024				18	18	18	19
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338				<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338				<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338				<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338				<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338				<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338				<1	<1	<1	6.79
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338				<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338				<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338				<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338				<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338				2.34	<1	<1	<1
Branched PFOS	<1 µg/kg	TM338				2.75	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338				<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- *** 6:2 FTAB (see appendix)
- 1-4♦§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SPRING 3	SPRING 4	TP301	TP301	TP301	TP302
			Depth (m)	.	.	0.50	1.00	2.00	0.25
			Sample Type	Ground Water (GW)	Ground Water (GW)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031045	31031046	31031005	31031006	31031007	31031008
			AGS Reference						
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338				<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338				<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338				<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338				<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338				<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338				5.09	<1	<1	<1
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428					<3		<3
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428					<3		<3
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428					<2		<2
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428					<1		<1
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428					<1		<1
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428					<1		<1
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428					<1		7.7
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428					<1		<1
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428					<1		<1
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428					<1		<1
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428					<1		<1
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428					<1		<1
Branched PFOS (Post Ox.)	<1 µg/kg	TM428					<1		<1
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428					<1		<1
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428					<1		<1
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428					<1		<1
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428					<1		<1
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428					<1		<1
Total PFOS (Post Ox.)	<2 µg/kg	TM428					<2		<2

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP302	TP302	TP303	TP303	TP303	TP304
			Depth (m)	1.00	1.50	0.25	1.00	1.50	0.75
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031009	31031010	31031011	31031012	31031013	31031014
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		17	11	23	32	18	19
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338		<2	<2	<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338		<1	<1	30.1	2.68	<1	1.37
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Branched PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428					<3		<3
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428					<3		<3
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428					<2		<2
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428					<1		<1
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428					<1		<1
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428					<1		<1
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428					<1		1.15
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428					<1		<1
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428					<1		<1
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428					<1		<1
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428					<1		<1
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428					<1		<1
Branched PFOS (Post Ox.)	<1 µg/kg	TM428					<1		<1

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- *** 6:2 FTAB (see appendix)
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP302	TP302	TP303	TP303	TP303	TP304
			Depth (m)	1.00	1.50	0.25	1.00	1.50	0.75
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031009	31031010	31031011	31031012	31031013	31031014
			AGS Reference						
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428					<1		<1
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428					<1		<1
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428					<1		<1
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428					<1		<1
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428					<1		<1
Total PFOS (Post Ox.)	<2 µg/kg	TM428					<2		<2

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601

Client Ref.: **Location:** Sladen Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP304	TP305	TP305	TP306	TP306	TP307
			Depth (m)	1.50	0.50	1.10	0.25	0.75	0.25
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031015	31031016	31031017	31031018	31031019	31031020
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		14	24	14	10	16	24
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338		<2	<2	<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338		1.19	1.49	<1	<1	<1	<1
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	1.46
Branched PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	1.46
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428			<3			<3	
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428			<3			<3	
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428			<2			<2	
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428			<1			<1	
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428			<1			<1	
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428			<1			<1	
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428			<1			<1	
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428			<1			<1	
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428			<1			<1	
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428			<1			<1	
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428			<1			<1	
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428			<1			<1	
Branched PFOS (Post Ox.)	<1 µg/kg	TM428			<1			<1	

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- *** 6:2 FTAB (see appendix)
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP304	TP305	TP305	TP306	TP306	TP307
			Depth (m)	1.50	0.50	1.10	0.25	0.75	0.25
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031015	31031016	31031017	31031018	31031019	31031020
			AGS Reference						
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428			<1			<1	
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428			<1			<1	
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428			<1			<1	
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428			<1			<1	
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428			<1			<1	
Total PFOS (Post Ox.)	<2 µg/kg	TM428			<2			<2	

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601

Client Ref.: **Location:** Sladen Mill

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Customer Sample Ref.	TP307	TP308	TP308	TP309	TP309	TP310
Depth (m)	0.50	0.25	0.50	0.50	1.50	0.25
Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled	03/02/2025	03/02/2025	03/01/2025	03/02/2025	03/02/2025	03/02/2025
Sample Time	.	.	.	.	.	.
Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
Lab Sample No.(s)	31031021	31031022	31034853	31031023	31031024	31031025
AGS Reference						

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	16	17	24	17	16	11
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338	<3	<3	<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338	<3	<3	<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338	<2	<2	<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338	<1	<1	1.36	<1	<1	<1
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338	<1	2.05	<1	<1	<1	<1
Branched PFOS	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338	<1	<1	<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338	<1	2.05	<1	<1	<1	<1
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428		<3			<3	
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428		<3			<3	
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428		<2			<2	
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428		<1			<1	
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428		<1			<1	
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428		<1			<1	
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428		<1			<1	
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428		<1			<1	
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428		<1			<1	
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428		<1			<1	
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428		<1			<1	
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428		<1			<1	
Branched PFOS (Post Ox.)	<1 µg/kg	TM428		<1			<1	

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- *** 6:2 FTAB (see appendix)
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP307	TP308	TP308	TP309	TP309	TP310
			Depth (m)	0.50	0.25	0.50	0.50	1.50	0.25
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/01/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031021	31031022	31034853	31031023	31031024	31031025
			AGS Reference						
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428			<1			<1	
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428			<1			<1	
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428			<1			<1	
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428			<1			<1	
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428			<1			<1	
Total PFOS (Post Ox.)	<2 µg/kg	TM428			<2			<2	

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601

Client Ref.: **Location:** Sladen Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP310	TP310	TP312	TP312	TP312	TP313
			Depth (m)	1.00	2.00	0.50	1.00	1.50	0.25
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031026	31031027	31031028	31031029	31031030	31031031
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		13	22	13	21	19	18
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338		<2	<2	<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338		<1	<1	<1	2.16	<1	4.57
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Branched PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428					<3		
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428					<3		
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428					<2		
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428					<1		
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428					<1		
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428					<1		
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428					1.32		
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428					<1		
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428					<1		
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428					<1		
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428					<1		
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428					<1		
Branched PFOS (Post Ox.)	<1 µg/kg	TM428					<1		

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- *** 6:2 FTAB (see appendix)
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP310	TP310	TP312	TP312	TP312	TP313
			Depth (m)	1.00	2.00	0.50	1.00	1.50	0.25
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031026	31031027	31031028	31031029	31031030	31031031
			AGS Reference						
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428					<1		
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428					<1		
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428					<1		
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428					<1		
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428					<1		
Total PFOS (Post Ox.)	<2 µg/kg	TM428					<2		

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601

Client Ref.: **Location:** Sladen Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP313	TP314	TP315	TP316	TP316	TP317
			Depth (m)	0.75	0.50	0.25	0.50	1.00	0.25
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031032	31031033	31031034	31031035	31031036	31031037
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		19	10	11	18	14	15
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338		<2	<2	<2	<2	<2	<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338		1.41	<1	<1	2.69	<1	<1
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Branched PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
6:2-FTS (27619-97-2)	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
Total PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	<1
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428					<3		
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428					<3		
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428					<2		
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428					<1		
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428					<1		
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428					<1		
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428					3.74		
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428					<1		
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428					<1		
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428					<1		
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428					<1		
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428					<1		
Branched PFOS (Post Ox.)	<1 µg/kg	TM428					<1		

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601
Client Ref.: **Location:** Sladen Mill

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- *** 6:2 FTAB (see appendix)
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP313	TP314	TP315	TP316	TP316	TP317
			Depth (m)	0.75	0.50	0.25	0.50	1.00	0.25
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031032	31031033	31031034	31031035	31031036	31031037
			AGS Reference						
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428					<1		
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428					<1		
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428					<1		
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428					<1		
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428					<1		
Total PFOS (Post Ox.)	<2 µg/kg	TM428					<2		

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601

Client Ref.: **Location:** Sladen Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP318	TP318	TP318	TP319	TP319	UPSTREAM
			Depth (m)	0.30	0.60	0.90	0.50	1.50	.
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Surface Water (SW)
			Date Sampled	03/02/2025	03/01/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031040	31031041	31031042	31031043	31031044	31031047
			AGS Reference						
PFBA (375-22-4)	<2 ng/l	TM434							<2 2 #
PFPA (2706-90-3)	<1 ng/l	TM434							<1 2 #
PFBS (375-73-5)	<1 ng/l	TM434							<1 2 #
PFHxA (307-24-4)	<1 ng/l	TM434							1.42 2 #
PFHpA (375-85-9)	<1 ng/l	TM434							1.89 2 #
PFPeS (2706-91-4)	<1 ng/l	TM434							<1 2 #
6:2 FTS (27619-97-2)	<1 ng/l	TM434							1.3 2 #
PFOA (335-67-1)	<0.65 ng/l	TM434							55.8 2 #
PFHxS (355-46-4)	<1 ng/l	TM434							<1 2 #
PFNA (375-95-1)	<1 ng/l	TM434							<1 2 #
PFHpS (375-92-8)	<1 ng/l	TM434							<1 2 #
PFDA (335-76-2)	<2 ng/l	TM434							<2 2 #
Linear PFOS (1763-23-1)	<0.65 ng/l	TM434							<0.65 2 #
Branched PFOS	<0.65 ng/l	TM434							<0.65 2 #
PFUnA (2058-94-8)	<2 ng/l	TM434							<2 2 #
PFDoA (307-55-1)	<2 ng/l	TM434							<2 2 #
PFDS (335-77-3)	<2 ng/l	TM434							<2 2 #
PFOSA (754-91-6)	<2 ng/l	TM434							<2 2 #
Total PFOS	<0.65 ng/l	TM434							<0.65 2 #
Moisture Content Ratio (% of as received sample)	%	PM024		11	18	16	20	13	
PFBA (375-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338		<3	<3	<3	<3	<3	
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338		<2	<2	<2	<2	<2	
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338		<1	<1	1.24	9.66	<1	
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338		1.8	<1	1.58	<1	<1	
Branched PFOS	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	

CERTIFICATE OF ANALYSIS

SDG: 250205-38 **Report Number:** 756610 **Superseded Report:** 756601

Client Ref.: **Location:** Sladen Mill

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
***	6:2 FTAB (see appendix)
1-4+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP318	TP318	TP318	TP319	TP319	UPSTREAM
			Depth (m)	0.30	0.60	0.90	0.50	1.50	.
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Surface Water (SW)
			Date Sampled	03/02/2025	03/01/2025	03/02/2025	03/02/2025	03/02/2025	03/02/2025
			Sample Time	.	.	.	.	.	.
			Date Received	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025	05/02/2025
			SDG Ref	250205-38	250205-38	250205-38	250205-38	250205-38	250205-38
			Lab Sample No.(s)	31031040	31031041	31031042	31031043	31031044	31031047
			AGS Reference						
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
6:2-FTS (27619-97-2)	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFDS (335-73-3) Perfluoro-1-decanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
PFPeS (2706-91-4) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM338		<1	<1	<1	<1	<1	
Total PFOS	<1 µg/kg	TM338		1.8	<1	1.58	<1	<1	
PFBA (Post Ox.) Perfluoro-n-butanoic acid	<3 µg/kg	TM428			<3			<3	
PFPA (Post Ox.) Perfluoro-n-pentanoic acid	<3 µg/kg	TM428			<3			<3	
PFHxA (Post Ox.) Perfluoro-n-hexanoic acid	<2 µg/kg	TM428			<2			<2	
PFBS (Post Ox.) Perfluoro-1-butanesulfonate	<1 µg/kg	TM428			<1			<1	
PFHpA (Post Ox.) Perfluoro-n-heptanoic acid	<1 µg/kg	TM428			<1			<1	
6:2 FTS (Post Ox.) Perfluoro-octane sulfonate 6:2	<1 µg/kg	TM428			<1			<1	
PFOA (Post Ox.) Perfluoro-n-octanoic acid	<1 µg/kg	TM428			<1			<1	
PFHxS (Post Ox.) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM428			<1			<1	
PFNA (Post Ox.) Perfluoro-n-nonanoic acid	<1 µg/kg	TM428			<1			<1	
PFHpS (Post Ox.) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM428			<1			<1	
PFDA (Post Ox.) Perfluoro-n-decanoic acid	<1 µg/kg	TM428			<1			<1	
Linear PFOS (Post Ox.) Perfluoro-1-octanesulfonate	<1 µg/kg	TM428			<1			<1	
Branched PFOS (Post Ox.)	<1 µg/kg	TM428			<1			<1	
PFUnA (Post Ox.) Perfluoro-n-undecanoic acid	<1 µg/kg	TM428			<1			<1	
PFDoA (Post Ox.) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM428			<1			<1	
PFOSA (Post Ox.) Perfluoro-octanesulfonamide	<1 µg/kg	TM428			<1			<1	
PFDS (Post Ox.) Perfluoro-1-decanesulfonate	<1 µg/kg	TM428			<1			<1	
PFPeS (Post Ox.) Perfluoro-1-pentanesulfonate	<1 µg/kg	TM428			<1			<1	
Total PFOS (Post Ox.)	<2 µg/kg	TM428			<2			<2	

Table of Results - Appendix

Method No	Description
PM024	Soil preparation including homogenisation, moisture, screens of soils for Asbestos Containing Material
TM338	Analysis of perfluoroalkylsulfonates and perfluorocarboxylic acids in Solids
TM428	Analysis of perfluoroalkylsulfonates and perfluorocarboxylic acids - Total Oxidizable Precursor Assay
TM434	Analysis of PFAS

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 250205-38 Report Number: 756610 Superseded Report: 756601
Client Ref.: Location: Sladen Mill

Test Completion Dates

Lab Sample No(s)	31031045	31031046	31031005	31031006	31031007	31031008	31031009	31031010	31031011	31031012
Customer Sample Ref.	SPRING 3	SPRING 4	TP301	TP301	TP301	TP302	TP302	TP302	TP303	TP303
AGS Ref.										
Depth			0.50	1.00	2.00	0.25	1.00	1.50	0.25	1.00
Type	Ground Water	Ground Water	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PFAS (Post Ox.) Solids				18-Feb-2025		18-Feb-2025				18-Feb-2025
PFAS Liquids (Full Suite)	13-Feb-2025	13-Feb-2025								
PFAS Solids			13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025
Sample description			05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	06-Feb-2025	06-Feb-2025	05-Feb-2025

Lab Sample No(s)	31031013	31031014	31031015	31031016	31031017	31031018	31031019	31031020	31031021	31031022
Customer Sample Ref.	TP303	TP304	TP304	TP305	TP305	TP306	TP306	TP307	TP307	TP308
AGS Ref.										
Depth	1.50	0.75	1.50	0.50	1.10	0.25	0.75	0.25	0.50	0.25
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PFAS (Post Ox.) Solids		18-Feb-2025		18-Feb-2025			18-Feb-2025			18-Feb-2025
PFAS Solids	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025
Sample description	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025

Lab Sample No(s)	31034853	31031023	31031024	31031025	31031026	31031027	31031028	31031029	31031030	31031031
Customer Sample Ref.	TP308	TP309	TP309	TP310	TP310	TP310	TP312	TP312	TP312	TP313
AGS Ref.										
Depth	0.50	0.50	1.50	0.25	1.00	2.00	0.50	1.00	1.50	0.25
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PFAS (Post Ox.) Solids			18-Feb-2025					18-Feb-2025		
PFAS Solids	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025
Sample description	06-Feb-2025	05-Feb-2025	06-Feb-2025	06-Feb-2025	06-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025

Lab Sample No(s)	31031032	31031033	31031034	31031035	31031036	31031037	31031040	31031041	31031042	31031043
Customer Sample Ref.	TP313	TP314	TP315	TP316	TP316	TP317	TP318	TP318	TP318	TP319
AGS Ref.										
Depth	0.75	0.50	0.25	0.50	1.00	0.25	0.30	0.60	0.90	0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
PFAS (Post Ox.) Solids				18-Feb-2025				18-Feb-2025		
PFAS Solids	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025	13-Feb-2025
Sample description	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	05-Feb-2025	06-Feb-2025	05-Feb-2025	05-Feb-2025

Lab Sample No(s)	31031044	31031047
Customer Sample Ref.	TP319	UPSTREAM
AGS Ref.		
Depth	1.50	
Type	Soil/Solid (S)	Surface Water
PFAS (Post Ox.) Solids	18-Feb-2025	
PFAS Liquids (Full Suite)		13-Feb-2025
PFAS Solids	13-Feb-2025	
Sample description	05-Feb-2025	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised.
This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur -
e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis.
The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l.
Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only.
It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

If during the search of the two ‘pinch’ samples by PLM only 1 or 2 fibres or fibre bundles are seen and identified as asbestos, the term ‘trace asbestos identified’ is reported.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Potentially respirable fibres are identified by using a Phase Contrast Microscope.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.
The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

21. 6:2 FTAB

Recovery of 6:2 FTAB in the quality control samples has been observed to be <50% of the target value. Please note the 6:2 FTAB result is supplied as indicative only.

ALS Laboratories (UK) Limited
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Coventry
CV4 9GU

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F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Mr Bowman
Soil and Structures Ltd
89 Moorhead Lane
Shipley BD18 4JW
West Yorkshire

14 June 2024

Test Report: COV/2669225/2024

Dear Mr Bowman

Analysis of your sample(s) submitted on 07 June 2024 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Laboratories (UK) Limited and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: A. Zunzunegui

Title: Organics Chemistry Manager

UKAS TESTING 1314

bsi ISO 14001 Environmental Management CERTIFIED EMS675527 ISO 45001 Occupational Health and Safety Management CERTIFIED OHS 542058

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

This communication has been sent to you by ALS Laboratories (UK) Limited. Registered in England and Wales. Registration No.02391955.
Registered Office: ALS Laboratories (UK) Limited, Torrington Avenue, Coventry, CV4 9GU.

Report Summary

ANALYSED BY

UKAS TESTING 1314

Mr Russell Bowman
Soil and Structures Ltd
89 Moorhead Lane
Shipley
West Yorkshire
BD18 4JW

Date of Issue: **14 June 2024**

Report Number: **COV/2669225/2024** Issue **1**

This issue replaces all previous issues

Job Description: Master Quote 2024

Job Location: 89 Moorhead Lane, Shipley, BD18 4JW

Number of Samples included in this report **3**

Job Received: **07 June 2024**

Number of Test Results included in this report **60**

Analysis Commenced: **08 June 2024**

Signed:

Name: **A. Zunzunegui** Date: **14 June 2024**

Title: **Organics Chemistry Manager**

ALS Laboratories (UK) Limited was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested and where relevant sampled.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.
This test report is not a statement of conformity to any specification or standard.

This communication has been sent to you by ALS Laboratories (UK) Limited. Registered in England and Wales. Registration No. 02391955. Registered Office: ALS Laboratories (UK) Limited, Torrington Avenue, Coventry, CV4 9GU.
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Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2669225/2024**	Issue	**1**
Laboratory Number:	**24108157**	Sample	**1** of **3**

Sample Source:	**Soil and Structures Ltd**	
Sample Point Description:		
Sample Description:	**Surface Water (Upstream)**	
Sample Matrix:	**Surface Water**	
Sample Date/Time:	**05 June 2024**	**10:04**
Sample Received:	**07 June 2024**	
Analysis Complete:	**14 June 2024**	

Test Description	Result	Units	Completed	Accreditation	Method
Sulphate as SO4	6.6	mg/l	10/06/2024	Y Cov	WAS036
PFOS	0.00081	ug/l	08/06/2024	Y Cov	GEO82
PFOA	0.0327	ug/l	11/06/2024	Y Cov	GEO82
Naphthalene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Acenaphthylene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Acenaphthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Fluorene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Phenanthrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(a)anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Chrysene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(b)fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(k)fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(a)pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Indeno(123cd)pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Dibenzo(ah)anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(ghi)perylene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
PAH, Total of 16	<0.010	ug/l	11/06/2024	N Cov	GEO81

Analyst Comments for 24108157: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **A. Zunzunegui** Date: **14 June 2024**

Title: **Organics Chemistry Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2669225/2024**	Issue	**1**
Laboratory Number:	**24108158**	Sample	**2** of **3**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Surface Water (Midstream)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**05 June 2024** **10:07**		
Sample Received:	**07 June 2024**		
Analysis Complete:	**14 June 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
Sulphate as SO4	6.7	mg/l	10/06/2024	Y Cov	WAS036
PFOS	0.00081	ug/l	08/06/2024	Y Cov	GEO82
PFOA	0.0346	ug/l	11/06/2024	Y Cov	GEO82
Naphthalene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Acenaphthylene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Acenaphthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Fluorene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Phenanthrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(a)anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Chrysene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(b)fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(k)fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(a)pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Indeno(123cd)pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Dibenzo(ah)anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(ghi)perylene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
PAH, Total of 16	<0.010	ug/l	11/06/2024	N Cov	GEO81

Analyst Comments for 24108158: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **A. Zunzunegui** Date: **14 June 2024**

Title: **Organics Chemistry Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2669225/2024**	Issue	**1**
Laboratory Number:	**24108159**	Sample	**3** of **3**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Surface Water (Downstream)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**05 June 2024** **10:12**		
Sample Received:	**07 June 2024**		
Analysis Complete:	**14 June 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
Sulphate as SO4	6.8	mg/l	10/06/2024	Y Cov	WAS036
PFOS	0.00089	ug/l	08/06/2024	Y Cov	GEO82
PFOA	0.0359	ug/l	11/06/2024	Y Cov	GEO82
Naphthalene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Acenaphthylene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Acenaphthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Fluorene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Phenanthrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(a)anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Chrysene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(b)fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(k)fluoranthene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(a)pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Indeno(123cd)pyrene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Dibenzo(ah)anthracene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
Benzo(ghi)perylene	<0.010	ug/l	11/06/2024	Y Cov	GEO81
PAH, Total of 16	<0.010	ug/l	11/06/2024	N Cov	GEO81

Analyst Comments for 24108159: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **A. Zunzunegui** Date: **14 June 2024**

Title: **Organics Chemistry Manager**

ANALYST COMMENTS FOR REPORT COV/2669225/2024 Issue 1

This issue replaces all previous issues

Date of Issue: **14 June 2024**

Sample No	Analysis Comments
24108157	
24108158	
24108159	

Signed:

Name: **A. Zunzunegui** Date: **14 June 2024**

Title: **Organics Chemistry Manager**

DETERMINAND COMMENTS FOR REPORT COV/2669225/2024

ISSUE 1

This issue replaces all previous issues

Date of Issue: 14 June 2024

Sample No	Description	Determinand	Comments

Signed:

Name: **A. Zunzunegui** Date: **14 June 2024**

Title: **Organics Chemistry Manager**

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ALS Laboratories (UK) Limited
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Mr Bowman
Soil and Structures Ltd
89 Moorhead Lane
Shipley BD18 4JW
West Yorkshire

17 July 2024

Test Report: COV/2687173/2024

Dear Mr Bowman

Analysis of your sample(s) submitted on 11 July 2024 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Laboratories (UK) Limited and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: D. Lewis

Title: Technical Inorganic Manager

UKAS TESTING 1314

bsi EMS675527 ISO 14001 Environmental Management CERTIFIED OHS 542058 ISO 45001 Occupational Health and Safety Management CERTIFIED

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

This communication has been sent to you by ALS Laboratories (UK) Limited. Registered in England and Wales. Registration No.02391955.
Registered Office: ALS Laboratories (UK) Limited, Torrington Avenue, Coventry, CV4 9GU.

Report Summary

ANALYSED BY

UKAS TESTING 1314

Mr Russell Bowman
Soil and Structures Ltd
89 Moorhead Lane
Shipley
West Yorkshire
BD18 4JW

Date of Issue: **17 July 2024**

Report Number: **COV/2687173/2024** Issue **1**

This issue replaces all previous issues

Job Description: Master Quote 2024

Job Location: 89 Moorhead Lane Shipley BD184JW

Number of Samples included in this report **5**

Job Received: **11 July 2024**

Number of Test Results included in this report **10**

Analysis Commenced: **13 July 2024**

Signed: D. Lewis

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

ALS Laboratories (UK) Limited was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested and where relevant sampled.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.
This test report is not a statement of conformity to any specification or standard.

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Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2687173/2024**	Issue	**1**
Laboratory Number:	**24234575**	Sample	**1** of **5**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Surface Water (Castle Brook)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**08 July 2024** **14:00**		
Sample Received:	**11 July 2024**		
Analysis Complete:	**17 July 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
PFOS	0.00081	ug/l	13/07/2024	Y Cov	GEO82
PFOA	0.0440	ug/l	16/07/2024	Y Cov	GEO82

Analyst Comments for 24234575: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: D. Lewis

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2687173/2024**	Issue	**1**
Laboratory Number:	**24234576**	Sample	**2** of **5**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Surface Water (Lydgate Brook)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**08 July 2024** **14:02**		
Sample Received:	**11 July 2024**		
Analysis Complete:	**17 July 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
PFOS	0.00072	ug/l	13/07/2024	Y Cov	GEO82
PFOA	0.0144	ug/l	16/07/2024	Y Cov	GEO82

Analyst Comments for 24234576: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: D. Lewis

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2687173/2024**	Issue	**1**
Laboratory Number:	**24234577**	Sample	**3** of **5**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Surface Water (Downstream)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**08 July 2024** **13:50**		
Sample Received:	**11 July 2024**		
Analysis Complete:	**17 July 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
PFOS	0.00075	ug/l	13/07/2024	Y Cov	GEO82
PFOA	0.0323	ug/l	16/07/2024	Y Cov	GEO82

Analyst Comments for 24234577: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: D. Lewis

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2687173/2024**	Issue	**1**
Laboratory Number:	**24234578**	Sample	**4** of **5**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Surface Water (25m Downstream)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**08 July 2024** **13:52**		
Sample Received:	**11 July 2024**		
Analysis Complete:	**17 July 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
PFOS	0.00089	ug/l	13/07/2024	Y Cov	GEO82
PFOA	0.364	ug/l	16/07/2024	Y Cov	GEO82

Analyst Comments for 24234578: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: D. Lewis

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2687173/2024**	Issue	**1**
Laboratory Number:	**24234579**	Sample	**5** of **5**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Surface Water (Spring)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**08 July 2024** **13:58**		
Sample Received:	**11 July 2024**		
Analysis Complete:	**17 July 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
PFOS	0.00177	ug/l	13/07/2024	Y Cov	GEO82
PFOA	0.318	ug/l	16/07/2024	Y Cov	GEO82

Analyst Comments for 24234579: No Analyst Comment

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: D. Lewis

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

ANALYST COMMENTS FOR REPORT COV/2687173/2024 Issue 1

This issue replaces all previous issues

Date of Issue: **17 July 2024**

Sample No	Analysis Comments
24234575	
24234576	
24234577	
24234578	
24234579	

Signed:

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

DETERMINAND COMMENTS FOR REPORT COV/2687173/2024

ISSUE 1

This issue replaces all previous issues

Date of Issue: 17 July 2024

Sample No	Description	Determinand	Comments

Signed: D. Lewis

Name: **D. Lewis** Date: **17 July 2024**

Title: **Technical Inorganic Manager**

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ALS Laboratories (UK) Limited
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Mr Bowman
Soil and Structures Ltd
89 Moorhead Lane
Shipley BD18 4JW
West Yorkshire

18 November 2024

Test Report: COV/2736186/2024

Dear Mr Bowman

Analysis of your sample(s) submitted on 17 October 2024 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Laboratories (UK) Limited and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: P. Patel

Title: Inorganics Chemistry Manager

UKAS TESTING 1314

bsi ISO 14001 Environmental Management CERTIFIED EMS675527 ISO 45001 Occupational Health and Safety Management CERTIFIED OHS 542058

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

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Registered Office: ALS Laboratories (UK) Limited, Torrington Avenue, Coventry, CV4 9GU.

Report Summary

ANALYSED BY

UKAS TESTING 1314

Mr Russell Bowman
Soil and Structures Ltd
89 Moorhead Lane
Shipley
West Yorkshire
BD18 4JW

Date of Issue: **18 November 2024**

Report Number: **COV/2736186/2024** Issue **3**

This issue replaces all previous issues

Job Description: Master Quote 2024

Job Location: Sladen Mill, Littleborough

Number of Samples included in this report **4**

Job Received: **17 October 2024**

Number of Test Results included in this report **151**

Analysis Commenced: **18 October 2024**

Signed:

Name: **P. Patel** Date: **18 November 2024**

Title: **Inorganics Chemistry Manager**

ALS Laboratories (UK) Limited was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested and where relevant sampled. Information supplied by the customer may affect the validity of results.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory. This test report is not a statement of conformity to any specification or standard.

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Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572653**	Sample	**1** of **4**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Spring 1**		
Sample Matrix:	**Not In Project**		
Sample Date/Time:	**10 October 2024**		
Sample Received:	**17 October 2024**		
Analysis Complete:	**18 November 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
Phenols Mono (Phenol Index)	<0.10	mg/l	18/10/2024	N Cov	WAS019

Analyst Comments for 24572653: {/*}Incorrect sample container received for Monophenol, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised.{*/}

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG), F = Data supplied by customer.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: P. Patel

Name: **P. Patel** Date: **18 November 2024**

Title: **Inorganics Chemistry Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**		Issue	**3**	
Laboratory Number:	**24572654**		Sample	**2**	of **4**
Sample Source:	**Soil and Structures Ltd**				
Sample Point Description:					
Sample Description:	**Spring 2**				
Sample Matrix:	**Not In Project**				
Sample Date/Time:	**10 October 2024**				
Sample Received:	**17 October 2024**				
Analysis Complete:	**18 November 2024**				

Test Description	Result	Units	Completed	Accreditation	Method
Phenols Mono (Phenol Index)	<0.10	mg/l	18/10/2024	N Cov	WAS019
PFBA (375-22-4)	0.003	ug/l	08/11/2024	N Cov	GEO88
PFPeA (2706-90-3)	0.003	ug/l	08/11/2024	N Cov	GEO88
PFHxA (307-24-4)	0.025	ug/l	08/11/2024	N Cov	GEO88
PFHpA (375-85-9)	0.036	ug/l	08/11/2024	N Cov	GEO88
PFOA (335-67-1)	Analyst Com	ug/l	14/11/2024	N Cov	GEO88
PFNA (375-95-1)	0.001	ug/l	08/11/2024	N Cov	GEO88
PFDA (335-76-2)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFUnA (2058-94-8)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFDoA (307-55-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFTrDA (72629-94-8)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFTeA (376-06-7)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFHxDA (67905-19-5)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFODA (16517-11-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFBS (375-73-5)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFPeS (2706-91-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFHxS (355-46-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFHpS (375-92-8)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFOS (1763-23-1)	0.004	ug/l	08/11/2024	N Cov	GEO88
PFNS (68259-12-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFDS(335-77-3)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFUnDS (749786-16-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFDoS (79780-39-5)	<0.001	ug/l	08/11/2024	N Cov	GEO88

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572654**	Sample	**2** of **4**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Spring 2**		
Sample Matrix:	**Not In Project**		
Sample Date/Time:	**10 October 2024**		
Sample Received:	**17 October 2024**		
Analysis Complete:	**18 November 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
HFPO-DA (Gen X) (13252-13-6)	0.001	ug/l	08/11/2024	N Cov	GEO88
HFPO-TA (13252-14-7)	0.017	ug/l	08/11/2024	N Cov	GEO88
DONA (919005-14-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFMOPrA (377-73-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
NFDHA (151772-58-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFMOBA (863090-89-5)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFecHS (133201-07-7/646-83-3)	<0.001	ug/l	08/11/2024	N Cov	GEO88
3:3 FTCA (356-02-5)	<0.010	ug/l	08/11/2024	N Cov	GEO88
5:3 FTCA (914637-49-3)	<0.001	ug/l	08/11/2024	N Cov	GEO88
7:3 FTCA (812-70-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFEESA (113507-82-7)	<0.001	ug/l	08/11/2024	N Cov	GEO88
6:2 Cl-PFESA (756426-58-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
8:2 Cl-PFESA (763051-92-9)	<0.001	ug/l	08/11/2024	N Cov	GEO88
4:2 FTSA (757124-72-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
6:2 FTSA (27619-97-2)	<0.001	ug/l	08/11/2024	N Cov	GEO88
8:2 FTSA (39108-34-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
FBSA (30334-69-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
FHxSA (41997-13-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
FOSA (754-91-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
MeFOSA (31506-32-8)	<0.001	ug/l	08/11/2024	N Cov	GEO88
EtFOSA (4151-50-2)	<0.001	ug/l	08/11/2024	N Cov	GEO88
MeFOSE (24448-09-7)	<0.001	ug/l	08/11/2024	N Cov	GEO88
EtFOSE (1691-99-2)	<0.001	ug/l	08/11/2024	N Cov	GEO88
NMeFOSAA (2355-31-9)	<0.001	ug/l	08/11/2024	N Cov	GEO88

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572654**	Sample	**2** of **4**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Spring 2**		
Sample Matrix:	**Not In Project**		
Sample Date/Time:	**10 October 2024**		
Sample Received:	**17 October 2024**		
Analysis Complete:	**18 November 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
NEtFOSAA (2991-50-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
6:2 FTAB (34455-29-3)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFAS, Sum of 48	Analyst Com	ug/l	14/11/2024	N Cov	GEO88

Analyst Comments for 24572654: This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis. Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised. See A/C for GEO88 PFOA at customer request. Indicative result 1255.265ng/l.{*/} Unable to report total PFAS.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG), F = Data supplied by customer.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **P. Patel** Date: **18 November 2024**

Title: **Inorganics Chemistry Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**		Issue	**3**	
Laboratory Number:	**24572655**		Sample	**3**	of **4**
Sample Source:	**Soil and Structures Ltd**				
Sample Point Description:					
Sample Description:	**Spring 3**				
Sample Matrix:	**Not In Project**				
Sample Date/Time:	**10 October 2024**				
Sample Received:	**17 October 2024**				
Analysis Complete:	**18 November 2024**				

Test Description	Result	Units	Completed	Accreditation		Method
Phenols Mono (Phenol Index)	<0.10	mg/l	18/10/2024	N	Cov	WAS019
PFBA (375-22-4)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFPeA (2706-90-3)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFHxA (307-24-4)	0.008	ug/l	08/11/2024	N	Cov	GEO88
PFHpA (375-85-9)	0.009	ug/l	08/11/2024	N	Cov	GEO88
PFOA (335-67-1)	Analyst Com	ug/l	14/11/2024	N	Cov	GEO88
PFNA (375-95-1)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFDA (335-76-2)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFUnA (2058-94-8)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFDoA (307-55-1)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFTrDA (72629-94-8)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFTeA (376-06-7)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFHxDA (67905-19-5)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFODA (16517-11-6)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFBS (375-73-5)	0.028	ug/l	08/11/2024	N	Cov	GEO88
PFPeS (2706-91-4)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFHxS (355-46-4)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFHpS (375-92-8)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFOS (1763-23-1)	0.002	ug/l	08/11/2024	N	Cov	GEO88
PFNS (68259-12-1)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFDS(335-77-3)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFUnDS (749786-16-1)	<0.001	ug/l	08/11/2024	N	Cov	GEO88
PFDoS (79780-39-5)	<0.001	ug/l	08/11/2024	N	Cov	GEO88

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572655**	Sample	**3** of **4**

Sample Source:	**Soil and Structures Ltd**
Sample Point Description:	
Sample Description:	**Spring 3**
Sample Matrix:	**Not In Project**
Sample Date/Time:	**10 October 2024**
Sample Received:	**17 October 2024**
Analysis Complete:	**18 November 2024**

Test Description	Result	Units	Completed	Accreditation	Method
HFPO-DA (Gen X) (13252-13-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
HFPO-TA (13252-14-7)	<0.005	ug/l	08/11/2024	N Cov	GEO88
DONA (919005-14-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFMOPrA (377-73-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
NFDHA (151772-58-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFMOBA (863090-89-5)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFecHS (133201-07-7/646-83-3)	<0.001	ug/l	08/11/2024	N Cov	GEO88
3:3 FTCA (356-02-5)	<0.010	ug/l	08/11/2024	N Cov	GEO88
5:3 FTCA (914637-49-3)	<0.001	ug/l	08/11/2024	N Cov	GEO88
7:3 FTCA (812-70-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFEESA (113507-82-7)	<0.001	ug/l	08/11/2024	N Cov	GEO88
6:2 Cl-PFESA (756426-58-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
8:2 Cl-PFESA (763051-92-9)	<0.001	ug/l	08/11/2024	N Cov	GEO88
4:2 FTSA (757124-72-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
6:2 FTSA (27619-97-2)	<0.001	ug/l	08/11/2024	N Cov	GEO88
8:2 FTSA (39108-34-4)	<0.001	ug/l	08/11/2024	N Cov	GEO88
FBSA (30334-69-1)	0.003	ug/l	08/11/2024	N Cov	GEO88
FHxSA (41997-13-1)	<0.001	ug/l	08/11/2024	N Cov	GEO88
FOSA (754-91-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
MeFOSA (31506-32-8)	<0.001	ug/l	08/11/2024	N Cov	GEO88
EtFOSA (4151-50-2)	<0.001	ug/l	08/11/2024	N Cov	GEO88
MeFOSE (24448-09-7)	<0.001	ug/l	08/11/2024	N Cov	GEO88
EtFOSE (1691-99-2)	<0.001	ug/l	08/11/2024	N Cov	GEO88
NMeFOSAA (2355-31-9)	<0.001	ug/l	08/11/2024	N Cov	GEO88

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

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Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572655**	Sample	**3** of **4**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Spring 3**		
Sample Matrix:	**Not In Project**		
Sample Date/Time:	**10 October 2024**		
Sample Received:	**17 October 2024**		
Analysis Complete:	**18 November 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
NEtFOSAA (2991-50-6)	<0.001	ug/l	08/11/2024	N Cov	GEO88
6:2 FTAB (34455-29-3)	<0.001	ug/l	08/11/2024	N Cov	GEO88
PFAS, Sum of 48	Analyst Com	ug/l	14/11/2024	N Cov	GEO88

Analyst Comments for 24572655:

This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis.
Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised.
See A/C for GEO88 PFOA at customer request. Indicative result 236.229ng/l.{*/} Unable to report total PFAS.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG), F = Data supplied by customer.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: P. Patel

Name: **P. Patel** Date: **18 November 2024**

Title: **Inorganics Chemistry Manager**

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572656**	Sample	**4** of **4**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Castle Brook (Upstream 2)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**10 October 2024**		
Sample Received:	**17 October 2024**		
Analysis Complete:	**18 November 2024**		

Test Description	Result	Units	Completed	Accreditation		Method
Phenols Mono (Phenol Index)	<0.10	mg/l	18/10/2024	N	Cov	WAS019
PFBA (375-22-4)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFPeA (2706-90-3)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFHxA (307-24-4)	0.002	ug/l	08/11/2024	Y	Cov	GEO88
PFHpA (375-85-9)	0.003	ug/l	08/11/2024	Y	Cov	GEO88
PFOA (335-67-1)	Analyst Com	ug/l	14/11/2024	Y	Cov	GEO88
PFNA (375-95-1)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFDA (335-76-2)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFUnA (2058-94-8)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFDoA (307-55-1)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFTrDA (72629-94-8)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFTeA (376-06-7)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFHxDA (67905-19-5)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFODA (16517-11-6)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFBS (375-73-5)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFPeS (2706-91-4)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFHxS (355-46-4)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFHpS (375-92-8)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFOS (1763-23-1)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFNS (68259-12-1)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFDS(335-77-3)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFUnDS (749786-16-1)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88
PFDoS (79780-39-5)	<0.001	ug/l	08/11/2024	Y	Cov	GEO88

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572656**	Sample	**4** of **4**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Castle Brook (Upstream 2)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**10 October 2024**		
Sample Received:	**17 October 2024**		
Analysis Complete:	**18 November 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
HFPO-DA (Gen X) (13252-13-6)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
HFPO-TA (13252-14-7)	<0.005	ug/l	08/11/2024	Y Cov	GEO88
DONA (919005-14-4)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
PFMOPrA (377-73-1)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
NFDHA (151772-58-6)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
PFMOBA (863090-89-5)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
PFecHS (133201-07-7/646-83-3)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
3:3 FTCA (356-02-5)	<0.010	ug/l	08/11/2024	Y Cov	GEO88
5:3 FTCA (914637-49-3)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
7:3 FTCA (812-70-4)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
PFEESA (113507-82-7)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
6:2 Cl-PFESA (756426-58-1)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
8:2 Cl-PFESA (763051-92-9)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
4:2 FTSA (757124-72-4)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
6:2 FTSA (27619-97-2)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
8:2 FTSA (39108-34-4)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
FBSA (30334-69-1)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
FHxSA (41997-13-1)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
FOSA (754-91-6)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
MeFOSA (31506-32-8)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
EtFOSA (4151-50-2)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
MeFOSE (24448-09-7)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
EtFOSE (1691-99-2)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
NMeFOSAA (2355-31-9)	<0.001	ug/l	08/11/2024	Y Cov	GEO88

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/2736186/2024**	Issue	**3**
Laboratory Number:	**24572656**	Sample	**4** of **4**
Sample Source:	**Soil and Structures Ltd**		
Sample Point Description:			
Sample Description:	**Castle Brook (Upstream 2)**		
Sample Matrix:	**Surface Water**		
Sample Date/Time:	**10 October 2024**		
Sample Received:	**17 October 2024**		
Analysis Complete:	**18 November 2024**		

Test Description	Result	Units	Completed	Accreditation	Method
NEtFOSAA (2991-50-6)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
6:2 FTAB (34455-29-3)	<0.001	ug/l	08/11/2024	Y Cov	GEO88
PFAS, Sum of 48	Analyst Com	ug/l	14/11/2024	N Cov	GEO88

Analyst Comments for 24572656: This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis. Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised. See A/C for GEO88 PFOA at customer request. Indicative result 97.449ng/l{*/} Unable to report total PFAS.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG), F = Data supplied by customer.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: P. Patel

Name: **P. Patel** Date: **18 November 2024**

Title: **Inorganics Chemistry Manager**

ANALYST COMMENTS FOR REPORT COV/2736186/2024 Issue 3

This issue replaces all previous issues

Date of Issue: **18 November 2024**

Sample No	Analysis Comments
24572653	{/*}Incorrect sample container received for Monophenol, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised.{*/}
24572654	This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis. Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised. See A/C for GEO88 PFOA at customer request. Indicative result 1255.265ng/l.{*/} Unable to report total PFAS.
24572655	This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis. Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised. See A/C for GEO88 PFOA at customer request. Indicative result 236.229ng/l.{*/} Unable to report total PFAS.
24572656	This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis. Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised. See A/C for GEO88 PFOA at customer request. Indicative result 97.449ng/l{*/} Unable to report total PFAS.

Signed:

Name: **P. Patel** Date: **18 November 2024**

Title: **Inorganics Chemistry Manager**

DETERMINAND COMMENTS FOR REPORT COV/2736186/2024

ISSUE 3

This issue replaces all previous issues

Date of Issue: 18 November 2024

Sample No	Description	Determinand	Comments

Signed:

Name: **P. Patel** Date: **18 November 2024**

Title: **Inorganics Chemistry Manager**

Report Changes

Job Changes

Field Changed	Before Value	After Value

Sample Changes

Sample Number	Field Changed	Before Value	After Value
24572656	analystComment	This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis. Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised. See A/C for GEO88 PFOA at customer request. Indicative result 1255.265ng/l{*/} Unable to report total PFAS.	This sample has been analysed for DWI PFAS 47 method GEO88 outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}Sample filtered through 0.45um filter prior to Monophenol analysis. Incorrect sample container received for Monophenol and PFAS, testing performed on sample from 500 ml PET. It is therefore possible that the provided results may be compromised. See A/C for GEO88 PFOA at customer request. Indicative result 97.449ng/l{*/} Unable to report total PFAS.

Result Changes

Sample Number	Det	Before Value	After Value

Moved Samples

Sample Number	Added/Removed

Project ref: **ENVPAC/1/GMC/00524**
Our ref: SO/2023/123384/02-L01
Your ref: Ben James

Date: 02 August 2023

Ben James
651a Mauldeth Road West
Chorlton Cum Hardy
Manchester
M21 7SA

Dear Ben

EMAIL 26/07/2023 OUTLINING BOREHOLES ON THE SITE. SLADEN MILL OFF HALIFAX ROAD LITTLEBOROUGH

Thank you for accepting our offer to provide detailed planning advice on the following submitted:

- Plan (dwg-tjba-luxure-sladen mill-090621) showing the proposed ground investigation location for planned groundwater investigation locations to further characterise the former Sladen Mill site.

We are providing this advice under Agreement No. **ENVPAC/1/GMC/00524.** Please note we have taken 2 hours to review and provide our advice. *[Please note there is 1 hour remaining on this agreement]*

Environment Agency Advice

We have reviewed the submission together with the previously reporting for the site to consider whether the proposed work sufficiently addresses the information gaps, which we discussed during our meeting earlier in July 2023. We have identified that the proposed additional works only cover the centre of the site. The work does not include the addition of boreholes on the Southern and Northern sectors of the site. We do not consider this to be adequate.

Consideration of the historic information for the site has identified the eastern parts of the southern section were formerly used for waste disposal. Therefore, there is a likelihood of mobile contamination migrating through the ground towards the western boundary where the surface watercourse is located.

Following the procedure set out in the Land Contamination Risk Management (LCRM) guidance, 2023, we consider there to be a significant possibility of a significant contaminant linkage between a possible source of contamination and a relevant receptor which will need investigating.

The same is true of the Northern sections of the site where the available information suggests tanks and filter beds/tanks were located.

By focusing on the central portion of the site, where the main mill buildings were located, the proposed additional works appear to exclude these potential sources of contamination and, potentially maintain the information gaps that we explained to you in our meeting in July 2023.

This additional work on your behalf has also identified that the site was previously occupied by Alderburgh Ltd. The manufacturing processes that were used during the companies' activities on site included plastics and waterproofing agents.

Recent research into emerging contaminants of concern has identified this process to be linked to the presence of Per- and Polyfluoroalkyl substances (PFAS).
PFAS [per- or polyfluoroalkyl substances] are an emerging contaminant of concern in the UK. Perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA) are common components of PFAS however there are over 9000 individual compounds that make up the umbrella term PFAS.

PFAS substances are known to be highly persistent in the environment, can be extremely mobile depending on their carbon chain length and very difficult to deal with when in an environmental setting.

Therefore, with this new information we advise you that with the potential for PFAS substances to be present these will likely be added to the list of determinants which are tested for and that, where those concentrations exceed the relevant water quality standard of 0.65 nanograms per litre in water a fuller risk assessment and, where necessary, remediation will be required.

We additionally advise you that, in line with current guidance on sampling groundwaters, a single round of sampling and testing would be considered insufficient. The exact number of rounds of sampling is a matter for the external project team and is likely to be based on the initial results from your testing (i.e., where the groundwater is found to be lesser impacted then a low number of testing rounds should be insufficient; conversely where contamination is present at higher concentrations then more rounds should be considered to confirm the values found).

Careful consideration should be given to these previously discarded/deposited materials as, if they need to be excavated / disturbed, they will retain their classification of being a waste and, as such, will require treatment to meet the end of waste status and be suitable for reuse without appropriate permitting.

Cont/d..

Under the current environmental legislation and regulations the use of a mobile treatment permit would not provide scope for you to meet a relevant end of waste criteria as prescribed in Article 6 of the Waste Framework Directive 2008/98/EC allowing for reuse under the CL:aire Code of Practice; Definition of Waste procedure. In order for you to show that you have met the end-of-waste criteria that is identified in this paragraph, it must be shown that the

…agreed end of waste criteria which means that waste has undergone a recovery (including recycling) operation and the substance or object:

- *is commonly used for a specific purpose.*
- *has a market demand.*
- *fulfils the technical requirements for the purpose; it meets existing legislation and standards for products will not result in an unacceptable impact on the environment or human health.*

In this circumstance you need to fully, and adequately, delineate the extent and nature of the materials within the area of deposited waste as it pertains to the proposed development land parcel.

A check of our records shows that this approach to former industrial parcels of land is not uncommon. Dealing with former industrial sites and legacy issues that they may present is not a straightforward process and often requires more resource and technical consideration than first thought.

Understanding the characterising industrial legacy issues is an iterative process where further sampling and assessment is frequently required as previously unidentified issues are uncovered and the risks associated with them need addressing such that they meet the requirements of the national planning policy framework guidance document (NPPF, 2021), specifically sections 174, 183 (a)–(c) and 184.

Next Steps
I hope the above advice is helpful. If there is any further work, you anticipate needing our detailed advice on in relation to this project, additional hours will need to be agreed.

Yours sincerely

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct dial 0203 0251059
Direct e-mail sylvia.whittingham@environment-agency.gov.uk

Disclaimer
Our opinion is based on the information available to us at the time of the enquiry. When the formal planning application is submitted, our position may change if there have been changes to environmental risk or evidence, and/or planning policy.

Our ref: SO/2023/123238/01-L02
Your ref: 23/00549/DOC

Date: 03 July 2023

Rochdale Metropolitan Borough Council
Development Control
Number One Riverside
Smith Street
ROCHDALE
Lancashire
OL16 1XU

Dear Sir/Madam

SUBMISSION OF DETAILS TO COMPLY WITH CONDITION 5 (INVESTIGATION AND RISK ASSESSMENT ON PLANNING PERMISSION 15/01235/OUT

SLADEN MILL OFF HALIFAX ROAD LITTLEBOROUGH

Thank you for referring the above application for the discharge of condition 5 and 17, to the Environment Agency, which we received on the 6 June 2023.

We have reviewed the following report: Geo-Environmental Audit, reference: rep-tjba mere grp-sladen mill-Phs 2 3 Env-250322.docx, dated 21/11/22 by T J Booth Associates, for submission of details to comply with condition 5 (investigation and risk assessment)

Environment Agency position
We note from the submission that the investigation comprised of a single borehole located in the centre of the site to determine coal presence and 10No. trial holes, some identifying hydrocarbon contamination of the groundwater. There have been no groundwater investigations to characterise the site. Also noted is the presence of concrete ground slabs to the former buildings which are still in place and comprise the entire footprint of this area; these areas need better characterisation of ground conditions. We also request more detail related to activities from the previous manufacturer Alderburgh Ltd.

Based on this, we are therefore unable to recommend the discharge of condition 5

We recommend that consideration is given to further intrusive ground investigation and groundwater sampling to confirm the condition of the site (as well as the associated risks).

Advice to applicant
Model Procedures and good practice
Due to the former land use(s), soil and /or groundwater contamination may exist at the site and the associated risks to controlled waters should be addressed by:

We recommend that developers should:

• Follow the risk management framework provided in Guidance on Land contamination risk management (LCRM) Land contamination risk management (LCRM) - GOV.UK (www.gov.uk), when dealing with land affected by contamination
• Refer to our Guiding principles for land contamination for the type of information that we require to assess risks to controlled waters from the site - the local authority can advise on risk to other receptors, such as human health
• Consider using the National Quality Mark Scheme for Land Contamination Management which involves the use of competent persons to ensure that land contamination risks are appropriately managed
• Refer to the contaminated land pages on gov.uk for more information
• Refer to 'The Environment Agency's approach to groundwater protection'

All investigations of land potentially affected by contamination should be conducted by or under the direction of a suitably qualified competent person and in accordance with BS 10175 (2001) Code of practice for the investigation of potentially contaminated sites.

Additional support
Should you wish us to review any technical documents or want further advice to address any of the environmental issues raised in this response, we may be able to do this as part of our charged for planning advice service. Further engagement will provide you with certainty of our position as to what our response to a planning application will be. It should also result in a better quality and more environmentally sensitive development.

As part of our charged for service we will provide a dedicated project manager to act as a single point of contact to help resolve any problems. We currently charge £100 per person per hour, plus VAT. We will provide you with an estimated cost for any further discussions or review of documents. Our standard terms and conditions are available to view online at www.gov.uk/government/publications/planning-and-marine-licenceadvice-standard-terms-for-our-charges/planning-and-marine-licence-for-our-charges

If you would like more information on our planning advice service, including a cost estimate, please contact us at SPPlanning.RFH@environment-agency.gov.uk
--
Should you have any queries regarding this response, then please do not hesitate to contact me

Please forward a copy of this letter to the applicant

Yours faithfully

Mrs. SYLVIA WHITTINGHAM
Planning Advisor
Direct e-mail sylvia.whittingham@environment-agency.gov.uk

Cont/d..

End

Rochdale Metropolitan Borough Council
Number One Riverside
Rochdale
Lancashire
OL16 1JH

Our ref: SO/2024/123863/01-L01
Your ref: 24/00001/DOC

Date: 14 February 2024

Dear Sir/Madam

SUBMISSION OF DETAILS TO COMPLY WITH CONDITION 5 (INVESTIGATION AND RISK ASSESSMENT) 15/01235/OUT SLADEN MILL OFF HALIFAX ROAD LITTLEBOROUGH

Thank you for referring the above application for the discharge of condition 5 to the Environment Agency. We would wish to make the following comments.

Environment Agency position

We have previously engaged with the developer and their environmental consultant through the Environment Agency's chargeable advice service providing verbal and written advice. Furthermore, we shared relevant industry guidance documents to support their further investigation and assessment of the former industrial site.

We have carefully reviewed the submitted report Geo-Environmental Audit (Phase 2 Site Investigation & Risk Assessment and Phase 3 Remediation Statement) by T J Booth & Associates Ltd (dated Dec. 2023). In keeping with the wording of condition 5 of outline planning permission 15/01235/OUT we advise as follows:

Condition 5

- We are satisfied that sufficient information has been submitted to support part (i) of condition 5.
- We consider that part (ii) of condition 5 has not provided sufficient assessment details to meet a standard that allows us to recommend discharge of part (ii) of the condition.
- We consider that there is deficiency in the limited assessments that have been made to satisfy part (iii) of the condition and as such do not recommend discharge of part (iii) of the condition.

Advice to the LPA,
We are satisfied that the development would prevent pollution of the water environment and ensure the safe development of the site in the interests of the amenity of future occupiers in accordance with Policy G9 of the adopted Rochdale Core Strategy, saved Policy EM/8 of the adopted Rochdale Unitary Development Plan and the National Planning Policy Framework 2023 paragraph 189(b) – '*land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990*'.

Please forward a copy of this letter to the applicant.

Yours faithfully

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct dial 0203 0251059
Direct e-mail sylvia.whittingham@environment-agency.gov.uk

End

Our ref: SO/2023/123238/01-L01
Your ref: 23/00549/DOC

Date: 26 June 2023

Rochdale Metropolitan Borough Council
Development Control
Number One Riverside
Smith Street
ROCHDALE
Lancashire
OL16 1XU

Dear Sir/Madam

SUBMISSION OF DETAILS TO COMPLY WITH CONDITION 5 (INVESTIGATION AND RISK ASSESSMENT), CONDITION 7 (CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN), CONDITION 10 (INVASIVE PLANS), CONDITION 11 (ARCHAEOLOGICAL RECORD & WRITTEN SCHEME OF INVESTIGATION), CONDITION 16 (EARTHMOVING) AND CONDITION 17 (METHOD STATEMENT AND MITIGATION STRATEGY) ON PLANNING PERMISSION 15/01235/OUT

SLADEN MILL OFF HALIFAX ROAD LITTLEBOROUGH

Thank you for referring the above application for the discharge of conditions 5 and 17, to the Environment Agency, which we received on the 6 June 2023. We have no objection in principle to the proposed development, but we would wish to make the following comments.

Environment Agency position

We have reviewed the following report: Geo-Environmental Audit, reference: rep-tjba-mere grp-sladen mill-Phs 2 3 Env-250322.docx, dated 21/11/22 by T J Booth Associates, for submission of details to comply with condition 5 (investigation and risk assessment) and condition 17 (Method Statement and Mitigation Strategy).

We note from the submission that the investigation comprised of a single borehole located in the centre of the site to determine coal presence and 10No. trial holes, some identifying hydrocarbon contamination of the groundwater. There have been no groundwater investigations to characterise the site. Also noted is the presence of concrete ground slabs to the former buildings which are still in place and comprise almost the entire footprint of this area; these areas need better characterisation of ground conditions. We also request more detail related to activities from the previous manufacturer Alderburgh Ltd. Based on this, we are therefore unable to recommend the discharge of condition 5 (and 17) attached to planning permission 15/01235/OUT in this circumstance.

We recommend that consideration is given to further intrusive ground investigation and groundwater sampling to confirm the condition of the site (as well as the associated risks).

Advice to applicant

Model Procedures and good practice
Due to the former land use(s), soil and /or groundwater contamination may exist at the site and the associated risks to controlled waters should be addressed by:
We recommend that developers should:

- Follow the risk management framework provided in Guidance on Land contamination risk management (LCRM) Land contamination risk management (LCRM) - GOV.UK (www.gov.uk), when dealing with land affected by contamination
- Refer to our Guiding principles for land contamination for the type of information that we require in order to assess risks to controlled waters from the site - the local authority can advise on risk to other receptors, such as human health
- Consider using the National Quality Mark Scheme for Land Contamination Management which involves the use of competent persons to ensure that land contamination risks are appropriately managed
- Refer to the contaminated land pages on gov.uk for more information
- Refer to 'The Environment Agency's approach to groundwater protection'

All investigations of land potentially affected by contamination should be carried out by or under the direction of a suitably qualified competent person and in accordance with BS 10175 (2001) Code of practice for the investigation of potentially contaminated sites.

Additional support
Should you wish us to review any technical documents or want further advice to address any of the environmental issues raised in this response, we may be able to do this as part of our charged for planning advice service. Further engagement will provide you with certainty of our position as to what our response to a planning application will be. It should also result in a better quality and more environmentally sensitive development.

As part of our charged for service we will provide a dedicated project manager to act as a single point of contact to help resolve any problems. We currently charge £100 per person per hour, plus VAT. We will provide you with an estimated cost for any further discussions or review of documents. Our standard terms and conditions are available to view online at www.gov.uk/government/publications/planning-and-marine-licenceadvice-standard-terms-for-our-charges/planning-and-marine-licence-advice-standardterms-for-our-charges.

If you would like more information on our planning advice service, including a cost estimate, please contact us at SPPlanning.RFH@environment-agency.gov.uk
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Should you have any queries regarding this response, then please do not hesitate to contact me.

Please forward a copy of this letter to the applicant.

Yours faithfully

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct e-mail sylvia.whittingham@environment-agency.gov.uk

End

Project ref: **ENVPAC/1/GMC/00524**
Our ref: SO/2023/123384/01-L01
Your ref: Ben James

Date: 27 July 2023

Ben James
651a Mauldeth Road West
Chorlton Cum Hardy
Manchester
M21 7SA

Dear Ben,

MEETING 21/07/2023 SLADEN MILL OFF HALIFAX ROAD LITTLEBOROUGH

Thank you for accepting our offer to meet with us on the 21 July 2023, to provide detailed planning advice. We are providing this advice under Agreement No. **ENVPAC/1/GMC/00524**. Please note we have taken 5 hours to meet, review and provide our advice. *[There are 3 hours remaining on this agreement]*

Attendees

Sylvia Whittingham	EA
William Hartley	EA
Lee Beveridge	EA
Ben James	Mere Development
Tim Booth	TJ Booth Associates
Daniel Slattery	TJ Booth Associates

Summary

It is our understanding that the site is to be redeveloped for residential units. From the information that has been previously provided to us we are aware that the site has been subject to a prolonged period of industrial land uses such that adverse concentrations of contamination may have been introduced into the environment such that there could be risks to the aquatic environment that must be addressed as a part of this redevelopment process.

As the Sladen Mill site is a former industrial site there is a good chance land contamination is present. Mills have operated there from the 1850s to 1950, and records show that Alderburgh Ltd once operated from the Sladen Mill site producing waterproofing materials for various industrial uses. The historic maps of the site show there to be potential sources of land contamination (including an old refuse tip/landfill) which should be subject to investigation as a part of the wider site characterisation.

This approach is governed and promoted by the National Planning Policy framework guidance (2021).

Paragraphs 174, 183 and 184 specifically require the developer to adequately investigate, characterise and assess their site to ascertain if the site does indeed pose a risk and, if so, to address those risks such that the land becomes fit for the intended purpose and suitable for the required use.

This approach is supported by the Land Contamination Risk Management guidance (LCRM, 2023) which describes the process whereby the site is investigated using appropriate techniques and adequate coverage such that there can be a reliance on the information, which has been collected and from where across the site. Supporting these approaches are a wealth of industry guidance and other advice reports from industry bodies.

Environment Agency Advice

Minutes of the meeting
During our meeting we outlined the necessary resources required to support you and your environmental consultant as you endeavour to meet the requirements to address the relevant discharge of conditions attached to your planning permission. We outlined what we considered to be an adequate standard and the methods by which this information could be reliably collected. We pointed to a variety of standards, including the industry recognised British Standard 10175, that could use to address our concerns.

We pointed to other suitable guidance to help you develop a conceptual site model that describes all possible sources of contamination, pathways by which that contamination may be mobilised and could be migrated and the relevant receptors that you should consider for the assessment of risk.

As we explained we are unable to give you specific numbers and locations for additional boreholes etc as this is not our role and we are not professionally able to accept that liability should something untoward occur or the number/locations be incorrect or insufficient.

We can confirm that only two additional boreholes are not sufficient as this would not meet the basic confidence level and density of investigation points that we would be seeking.

Informatives
The DoE Industrial Profile series is available online through an appropriate search engine that can provide guidance on the types of contamination which different types of industries in the UK produced as a result of their operations, we can point you to an NHBC Land Contamination guidance for small brownfield sites (A guide to small brownfield sites and land contamination (nhbc.co.uk)) as well as the Defra/EA website for land contamination (Land contamination: technical guidance - GOV.UK (www.gov.uk)) if that would help clarify matters.

It is important to undertake a thorough ground investigation so that you are aware of site conditions and can make important decisions about risk, materials retention and where assessment indicates remediation and validation.

Cont/d..

Whilst we did not speak about the presence of a former landfill on site this is one such example where improved investigation should be undertaken (but not limited to) as this is a ready source of land and groundwater contamination.

Given as the site is immediately next to a surface watercourse and your consultant has identified a body of groundwater, there is evidence of sensitive environmental receptors present and in potential need of protection.

The Environment Agency is not opposed to development on brownfield land. We are committed to ensuring that land impacted by land contamination is brought back into beneficial use but we cannot and will not accept developments that fail to safeguard the environment and as a result will continue with our current position until such time that sufficient and suitable information is presented that shows, beyond a level of reasonable doubt, that your site does not and will not pose an unacceptable risk to Controlled Waters now and in the future.

Next Steps
Details should be submitted to show you have adequately investigated, characterised, and assessed the site to a standard we can safely discharge the relevant planning condition(s).

I hope the above advice is helpful.

Yours sincerely

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct dial 0203 0251059
Direct e-mail sylvia.whittingham@environment-agency.gov.uk

Disclaimer
Our opinion is based on the information available to us at the time of the enquiry. When the formal planning application is submitted, our position may change if there have been changes to environmental risk or evidence, and/or planning policy.

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End

Rochdale Metropolitan Borough Council
Number One Riverside
Smith Street
Rochdale
OL16 1XU

Our ref: SO/2023/123238/02-L02
Your ref: 23/00549/DOC

Date: 28 July 2023

Dear Sir/Madam

SUBMISSION OF DETAILS TO COMPLY WITH CONDITION 5 (INVESTIGATION AND RISK ASSESSMENT), CONDITION 7 (CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN), CONDITION 10 (INVASIVE PLANS), CONDITION 11 (ARCHAEOLOGICAL RECORD & WRITTEN SCHEME OF INVESTIGATION), CONDITION 16 (EARTHMOVING) AND CONDITION 17 (METHOD STATEMENT AND MITIGATION STRATEGY) ON PLANNING PERMISSION 15/01235/OUT SLADEN MILL OFF HALIFAX ROAD LITTLEBOROUGH

Thank you for referring the above application for the discharge of condition 5 to the Environment Agency.

Environment Agency position

Condition 5
We have reviewed the following report and would wish to make the following comments. We do not recommend discharge of condition 5.

Geo-Environmental Audit, reference: rep-tjba-mere grp-sladen mill-Phs 2+3 Env-250322.docx, dated 21/11/22 by T J Booth Associates.

The site needs to to be adequately investigated, characterised, and assessed before we can recommend discharge of condition 5. We recommend that consideration is given to further intrusive ground investigation and groundwater sampling to confirm the condition of the site (as well as the associated risks).

Informatives
Following a meeting with the applicant/developer (21 July 2023), we are working with them to address the above issues.

Please forward a copy of this letter to the applicant.

Yours faithfully

Mrs. SYLVIA WHITTINGHAM
Planning Advisor

Direct dial 0203 0251059
Direct e-mail sylvia.whittingham@environment-agency.gov.uk

End

Rochdale Metropolitan Borough Council
Number One Riverside
Smith Street
Rochdale
OL16 1XU

Our ref: SO/2024/123863

Your ref: 24/00001/DOC

Date: 28 March 2024

Dear Majid Mir,

Submission of details to comply with condition 5 (investigation and risk assessment) 15/01235/OUT.

Sladen Mill Halifax Road Littleborough Rochdale OL15 0LB.

Thank you for the submission of a Geo-Environmental Audit (Phase 2 Site Investigation & Risk Assessment and Phase 3 Remediation Statement) [Version 5] by T J Booth & Associates ltd (dated February 2024) for the Proposed Residential Development on land at the former Sladen Mill, Littleborough in Rochdale pursuant to the application discharge conditions in compliance with condition 5 (investigation and risk assessment) attached to planning permission 15/01235/OUT.

Environment Agency position

At the request of Rochdale Metropolitan Borough Council, we have reviewed the submission of version 5 of the above report to ascertain if it contains sufficient information to allow us to recommend the discharge of condition 5 of planning permission 15/01235/OUT.

We have carefully considered the information that is contained in the context of our recommendations to the applicant following the review of version 4 of the same report. We have reviewed the report in the context of the Land Contamination Risk Management guidance (LCRM, 2023) and the National planning policy framework guidance document (NPPF, 2023).

We again welcome the additional ground investigation work that has been undertaken as it continues to improve the characterisation and understanding of the site allowing for a more thorough assessment of risks to controlled waters.

We have therefore considered the results of this additional information and identified that certain contaminants of concern are present in the identified groundwaters beneath the site, but the final conceptual model has assessed this to be of very low risk.

We disagree with this position as the ground investigation logs confirm the absence of a lower permeability layer that is protective of the underlying sandstone bedrock deposits suggesting that there is indeed a likely pathway between the source and receptors. A good number of the reported logs show a likely direct linkage between the upper made ground deposits and the underlying natural deposits and therefore the underlying aquifer.

Cont/d..

Based on the principles of LCRM, 2023 we strongly disagree with this evaluation as the presence of contaminants of concern in relevant receptors (i.e. the groundwater body identified beneath the site in the attached borehole and trial pit logs) is in itself at least a moderate to high risk as this is, in itself, a source, pathway and relevant receptor.

When we previously recommended that further assessment was undertaken, we anticipated that the principles of LCRM, 2023 would be applied and that a suitable (numeric) detailed quantitative risk assessment would be undertaken especially as some of the contaminants of concern are considered hazardous and assessment of their risk to relevant receptors undertaken. We feel that this is additionally supported by the Groundwater (Daughter) directive 2006/118/EC.

This version does not undertake that work therefore we are unable to agree that no remediation is required.

In undertaking this work we advise that you consider and follow the Remedial Targets Methodology guidance document (Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination (RTM P20) ref. LIT 6627, EA, 2006) which can be found at this website address Land contamination: remedial targets methodology (RTM) - GOV.UK (www.gov.uk).

Further, we recommend that where possible site specific input parameters are used to populate your chosen model so that the risk assessment reflects ground conditions as closely as possible and only used academic or generic values in the absence of real-world alternatives.

Therefore, regretfully, we are unable to recommend the discharge of condition 5 attached to planning permission 15/01235/OUT at this time.

-

Should you have any queries regarding this response, please do not hesitate to contact me.

Yours sincerely,

Miss India Blythin
Planning Advisor

Spplanning.rfh@environment-agency.gov.uk

End

creating a better place

Environment Agency

Majid Mir
Rochdale Borough Council
Floor 3
Number One Riverside
Smith Street
Rochdale
OL16 1XU

Our ref: SO/2024/123863/04
Your ref: 24/00001/DOC

Date: 16 September 2024

Dear Majid,

Submission of details to comply with condition 5 (investigation and risk assessment) 15/01235/OUT.

Sladen Mill, Halifax Road, Littleborough, Rochdale, OL15 0LB

Thank you for re-consulting us on the above application, with the latest additional information being submitted on 2 September 2024.

Environment Agency Position
As part of the re-consultation, we have reviewed the following additional information:

- A Controlled Waters Risk Assessment prepared by Soil & Structures Ltd and dated 23 August 2024 (ref. 2403-R-001-V03)
- Remediation Strategy prepared by Soil & Structures Ltd and dated 23 August 2024 (ref. 2403-R-002-V02).

The additional information does not satisfactorily address our earlier concerns. We therefore cannot recommend that condition 5 (investigation and risk assessment), as attached to planning permission 15/01235/OUT, can be discharged at this time.

Reasons
The additional information submitted does not satisfy our earlier concerns, as clarified in recent discussions, conclusions, and agreed next steps with the applicant's consultants facilitated through our charged for planning advice service. Most notably, this includes the need for additional, adequate ground investigation and assessment. We do not believe the additional information is sufficient to satisfy this requirement.

Cont/d..

INVESTOR IN PEOPLE

The salient points being:

- Further investigation of the Bedrock Sandstone Aquifer is required to determine whether the aquifer should be considered within the risk assessment as a receptor.
- Further consideration through additional investigation of the presence of PFAS (Per- and Polyfluoroalkyl Substances) in the soils and shallow groundwaters needed to be undertaken. The current scope of information is insufficient.
- We advised that simply sampling for PFOA and PFOS was not sufficient in the context of historic industrial activity and that a fuller suite of PFAS compounds was needed including TOP Assay and Pre-oxidisation testing especially as the site has undergone extensive reprofiling.
- In regards of the Remedial Target Methodology [RTM P20] (and the accompanying Remedial Targets Worksheets); consideration and assessment should be based on maximum identified values rather than average or mean values. As per the RTM P20 guidance variation should be achieved through sensitivity analysis.
- We understand earth movements on site have already taken place meaning that, potentially, contaminants of concern already identified might have been moved elsewhere on site. Additional work (ground investigation, risk assessment and likely remediation strategy) to be undertaken, including any surveys/logs of on-site movements, should be take this into account.
- Amendment to the Flood Risk Activity Permit is required for any proposed management plans for the pipes found within 8 metres of the main river's top of bank.

These submissions are based on existing information which we have already identified as being inadequate/insufficient.

Advice to Applicant
Regarding the requirement for the Flood Risk Activity Permit (FRAP) amendment, please see the below for more information regarding FRAP requirements.

The Environmental Permitting (England and Wales) Regulations 2016 require a permit or exemption to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in the floodplain of a main river if the activity could affect flood flow or storage and potential impacts are not controlled by a planning permission

For further guidance please visit https://www.gov.uk/guidance/flood-risk-activities-environmental-permits or contact our National Customer Contact Centre on 03708 506 506 (Monday to Friday, 8am to 6pm) or by emailing enquiries@environment-agency.gov.uk.

Cont/d..

The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

Advice to LPA

If you are minded to approve the discharge of condition application contrary to our concerns raised, please contact us to explain why material considerations outweigh our concerns. This will allow us to make further representations.

Please forward a copy of this letter to the applicant.

Should you have any queries regarding this response, please do not hesitate to contact me.

Yours sincerely,

Jamie Malone
Planning Advisor

E-mail: SPPlanning.RFH@environment-agency.gov.uk

End

russell@soilandstructures.co.uk

From: David Marsden <>
Sent: 31 May 2024 08:55
To: 'Ben James'
Cc: Russell Bowman
Subject: RE: Sladen Mill

Good Morning Ben,

Please see the groundwater sampling methodology below:

- The standpipes were purged prior to sampling.
- The monitoring wells and river were sampled using 39mm diameter disposable bailers fitted with non-return ball valves in general accordance with BS ISO 5667-11, 2009.
- The bailers were emptied directly into 50ml vial which were transported from site in insulated containers with ice packs to maintain a low temperature.
- Fresh clean bailers were used for each sample location.
- The groundwater levels were recorded before carrying out the purging/sampling.
- The sampling containers, insulated boxes and ice packs were supplied by the testing laboratory (ALS) and were certified as PFAS free. The bailers, were also certified as PFAS free by our suppliers.

If you need anything further, please do not hesitate to get in touch.

Kind regards
David Marsden MEng (Hons.) CEng MICE
Director

For and on behalf of
Sub Surface North West Ltd
3 Peel Street, Preston, Lancashire, PR2 2QS

Phone:
Email:
Website: www.subsurface.co.uk

Conditions of Use and Disclaimer

russell@soilandstructures.co.uk

From: David Marsden <dmarsden@subsurface.co.uk>
Sent: 31 May 2024 08:55
To: 'Ben James'
Cc: russell@soilandstructures.co.uk
Subject: RE: Sladen Mill

Good Morning Ben,

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- The monitoring wells and river were sampled using 39mm diameter disposable bailers fitted with non-return ball valves in general accordance with BS ISO 5667-11, 2009.
- The bailers were emptied directly into 50ml vial which were transported from site in insulated containers with ice packs to maintain a low temperature.
- Fresh clean bailers were used for each sample location.
- The groundwater levels were recorded before carrying out the purging/sampling.
- The sampling containers, insulated boxes and ice packs were supplied by the testing laboratory (ALS) and were certified as PFAS free. The bailers, were also certified as PFAS free by our suppliers.

If you need anything further, please do not hesitate to get in touch.

Kind regards
David Marsden MEng (Hons.) CEng MICE
Director

For and on behalf of
Sub Surface North West Ltd
3 Peel Street, Preston, Lancashire, PR2 2QS

Phone: 01772 561135
Email: dmarsden@subsurface.co.uk
Website: www.subsurface.co.uk

Conditions of Use and Disclaimer

Heritage Note

CLIENT:	**Mere Development Group**
PROJECT:	**Sladen Mill, Littleborough**
SUBJECT:	**Historical research into the industrial uses and practises at Sladen Mill in comparison with nearby Wellfield Mill, Rock Nook Mill and Sladen Wood Mill**
JOB NO.:	**GM12948**
DATE:	**14th August 2024**
PREPARED BY:	**Gabriella Amos BA MSc PCIfA**
CHECKED BY:	**Mike Birtles Bsc (Hons) Msc ACIfA**

1.1 Introduction

This Heritage Note has been prepared to provide an overview of the historical and industrial uses and practises that occurred at Sladen Mill (the 'Site'), in comparison with other historical mills including Wellfield Mill, Rock Nook Mill and Sladen Wood Mill. This Heritage Note has been prepared on behalf of Mere Development Group (the 'Client') in response to an ongoing enquiry with the Environment Agency regarding the historical use of contaminant material at the Site during its function as a mill. The Environment Agency has highlighted the presence of chemical contaminants at the Site:

> *"Our review is based on previous submissions of ground investigation and assessments that have been undertaken for the proposed development site. This work identified a prolonged industrial land usage on site which, most recently included the manufacturing of textiles, plastics, and waterproof coatings. The submitted reports have identified several contaminants of concern that include Per- and Polyfluoroalkyl substances (PFAS) and PFOS and PFOA. Based on the history of the site and its use in conjunction with the previous submissions we have considered and assessed the risk assessment process in this submission. We have reviewed the report in the context of the Remedial Targets Methodology guidance document (Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination (RTM P20) ref. LIT 6627, EA, 2006)"* (pers comms from Client, dated 05.08.2024).

The Client has noted that other textile-producing mills within the vicinity of the Site were undertaking practises using the abovementioned chemicals, which they believe may have infiltrated into watercourses or groundwater, and thus point to a wider-scale problem within the area of Littleborough not solely isolated to the Client's site (pers comms, dated 05.08.2024).

This document is intended to set out the historical narrative of each of the four mills: Sladen Mill; Wellfield Mill; Rock Nook Mill and Sladen Wood Mill, based on the available historical evidence. It is important to note that Sladen Mill (the Client's site) and Sladen Wood Mill are two separate sites that functioned under different corporations during their history. There is no clear relationship between these two sites beyond their proximity to Littleborough and the use of the local placename 'Sladen' in their titles.

A historical appraisal of the Site was previously conducted by Wardell Armstrong in 2015. A Heritage Impact Assessment was written in support of a planning application for a proposed residential development at the Site. This Heritage Note is not intended to act as a replica of the Impact Assessment, although elements of the assessment have been consulted to inform this report (Wardell Armstrong 2015). In conjunction with the above, the following baseline data has been consulted for this Heritage Note:

- Greater Manchester Historic Environment Record (GMHER)
- Rochdale Local Studies Archive Centre
- Ordnance Survey (OS) Historic Mapping, via the National Library of Scotland
- Historic England's Aerial Photography Archive

Documentary and online sources which have been consulted are cited within the text and listed in the Bibliography of this report.

This report has been prepared in accordance with documents published by the Chartered Institute for Archaeologists (CIfA 2022).

1.2 **Sladen Mill**

The earliest known document considered to be related to the Site dates to 1789 and refers to an auction, comprising '*a farmhold and mill called Sladon Mill, containing 25 acres land, in the occupation of Mr. Richard Hold and Samuel Lomar*' (GMHER 2024). A document dated to 1804 records a lease for the duration of twenty-one years by Charles Chadwick to Samuel Lomax, a woollen manufacturer of Sladen Mill (National Archives Ref: RYCH/3550). Lomax and Holt are mentioned later in Pigot's Directory of 1841 as 'woollen manufacturers' in the area of Rochdale (Pigot & Co. 1841).

Further evidence of occupation at the Site during the late-18th century can be seen in the 1970 discovery of a coin, 'truck token', dating to 1791 and uncovered during demolition works on former workers cottages associated with the mill. The coin was inscribed with the following text: 'payable at the warehouse of John Kershaw' (Rochdale Observer, 1970). John Kershaw and his brothers Isaac and Charles ran Sladen Mill until the partnership was dissolved in 1867. John and Isaac continued operating Sladen Mill, while Charles operated Field [Wellfield] Mill under Charles Kershaw Limited from c.1867 onwards (Seyd & Co. 1885-6).

Sladen Mill is referenced in several trade directories from the 19th to 20th centuries. Wright's directory from 1871-2 lists the Kershaw Brothers at Sladen Mill as flannel manufacturers (Wright 1871), whilst the Cotton Spinners & Manufacturers' Directory of 1891 notes the Site manufactured wool and flannel (Worrall 1891). Furthermore, a newspaper article from 1889 records that a warehouse was constructed at Sladen Mill, on the site of the 'woolen mills' (Wade 1889). Kelly's directory of 1907 also notes that Sladen Mill manufactured flannel, and that the Kershaw Brothers were wool merchants (Kelly's Directories Ltd 1907).

The mill suffered from a fire in 1926, which caused extensive damage to most of the buildings on site. This event led to the site being advertised for auction in The Guardian paper, which describes the 'fire salvage of flannel, flannelette, wool' (The Guardian 1926).

Further trade directories from 1967 and 1971 show that Sladen Mill was still functioning under the Kershaw name of 'Kershaw Chas Ltd', undertaking business in wool manufacturing of 'imitation Welsh and Lancashire flannels' (John Worrell Publishers 1967) as well as bleaching, dyeing, raising and finishing flannelettes, winceyettes and cotton blankets, which was introduced at the Site during the 1960s (Thomas Skinner Directories 1971). The Site ceased its function as a working mill and was separated into industrial units during the 1980s (Wardell Armstrong 2015), prior to its demolition and clearing over the past 10 years.

Cartographic sources can be used to show the development of the Site over time from the mid-19th century to the mid-20th century. In Lancashire map of 1851, the mill is depicted as a series of buildings in an irregular form, adjacent to a watercourse to the south (identifiable as Lydgate Brook / Lydgate Clough / Red Brook) and a canal drain to the north (Plate 1). Lydgate Brook is marked on the first edition OS map of 1893 with arrows pointing to indicate the direction of flow, marked as flowing downstream from south to north. This watercourse meanders from south towards the Site, around the Site heading north, then travelling west to pass underneath the Rochdale Canal via a weir. This course is largely unchanged and is still visible as an earthwork today (Google Earth 2024). The canal drain to the north of the Site appears to be shown extending from Wellfield Mill and heading south towards the Site, then

meandering northwest towards Rock Nook Mill (Plate 2). It is noted that the drain was constructed to transport water from surrounding reservoirs such as Hollingbrook Lake, located 2.5km south of the Site, to infill the Rochdale Canal (MBA Ltd 2020). The OS map of 1911 depicts the direction of water flow of the canal drain indicated by an arrow pointing northwest, adjacent to Rock Nook Mill (Plate 3).

Over time, the Site changes in shape and form, reflecting the rebuilding of Sladen Mill after the destructive 1926 fire. The surrounding vicinity is largely unchanged, with Lydgate Brook and the canal drain maintaining their general trajectory running between Wellfield Mill, Sladen Mill and Rock Nook Mill (Plates 3–5).

Similarly, aerial photographs can provide an understanding of the historical changes which have occurred on Site. An aerial photograph from 1948 depicts the Site within its industrialised rural landscape, located in the background of the photograph looking southeast. Within the foreground is the nearby Greenvale Mill, operated at this time by Fothergill & Harvey (see Section 1.4 below). The tramway identifiable on the OS 1893 map (Plate 2) appears to have been turned into a road, and the canal drain is located on a higher level to most of the mill buildings to the north. Lydgate Brook to the south of the Site disappears underneath the elevated canal at the point where it joins to the southeast of Greenvale Mill, entering a culvert or weir as shown on historic mapping from this period (Plate 4) (Historic England Ref: EAW020428). Further aerial photographs from the 1980s were provided by the Greater Manchester HER. These depict the Site as more built-up, with the addition of more modernised warehouse buildings on the southern side of the mill. The canal drain appears to be largely dried out at this time, although Lydgate Brook to the south of Sladen Mill seems to contain water (GMHER Refs: SF316355 – SF316358).

In consideration of the evidence presented above, the historical use of the Site seems to have comprised the manufacturing of cotton, wool and flannel materials, with a later addition of dyeing and bleaching in the 1960s, prior to the cessation of mill workings during the 1980s when the Site was converted into industrial units (Wardell Armstrong 2015).

1.3 **Wellfield Mill**

Situated 450m northeast of the Site is the location of the former Wellfield Mill. The earliest evidence of Wellfield Mill is shown on the Lancashire Map of 1851, where the site is labelled as a ‘fulling’ mill (Plate 1). As previously noted, Charles Kershaw operated the site under his own company name from c.1867 onwards (Seyd & Co. 1885-6). Twenty years after this event, the mill is referenced in Leuchs’ Directory as a ‘Fulling Mill’ under the ownership of Charles

Kershaw (C. Leuchs & Co. 1888). In 1891, the mill is mentioned in the Cotton Spinners & Manufacturers' Directory as a dyers and finishers mill (Worrall 1891).

Between the late 19th and mid-20th centuries, historical evidence of the use of Wellfield Mill is limited. However, this can be insinuated from the descriptions of the mill on historic mapping during this time. For instance, the OS map of 1911 depicts Wellfield Mill with the description of 'Fuelling, Dyeing, etc.' (Plate 3). It is clear there was a slight change in working processes at the site, as the following map of 1930 describes Wellfield Mill as a 'bleaching & dyeing' mill (Plate 4).

The next available historical reference of Wellfield Mill is within the Cotton Spinners' and Manufacturers' Directory of 1962, which described the mill as a 'bleachers, dyers, raisers and finishers' (John Worrell Publishers 1962). In 1967, the same directory describes the site as manufacturing 'flannels, flannelettes and serges' under the ownership of Kershaw Chas Ltd, now listed in combination with the Kershaw's site at Sladen Mill (John Worrell Publishers 1967). Wellfield Mill and Sladen Mill are both described as bleachers, dyers, raisers and finishers of flannelettes, winceyettes and cotton blankets under Kershaw Chas Ltd in The Lancashire Textile Industry directory of 1971 (Thomas Skinner Directories 1971).

Aerial photographs from the mid-20th century were reviewed as part of this assessment, but the available photographs were captured at a far distance, making it difficult to form an interpretation of the mill during this time period.

In summary, the available evidence suggests that Wellfield Mill functioned as a fulling mill, working with cotton materials for the recorded periods of its operation. The mill diversified into bleaching, dyeing and finishing during the early to mid-20th century. Historical evidence detailing the types of chemicals which may have been used in these processes has not been identified as part of this assessment. However, it is clear that the relationship between the Site and Wellfield Mill extends beyond their physical proximity, with Wellfield Mill located upstream from Sladen Mill. The connection between these two mills is reflected in their shared ownership under the Kershaw name, and their involvement in the wool and cotton industries for a recorded period of around 130 years.

1.4 **Rock Nook Mill**

Located 550m northwest of the Site is the former Rock Nook Mill. This mill was established in 1886 by Fothergill & Harvey, a company formed in 1847 (Fothergill Group 2024; GMHER 2024). The mill formed part of the Rock Nook Conservation Area prior to its recent demolition

in 2023 (GMHER 2024), and a Statement of Heritage Significance of the mill was produced in 2020 (MBA Ltd 2020).

Early evidence indicates that the mill was originally used for spinning cotton, as reflected on historic mapping from 1893 (Plate 2). Kelly's Directory of 1907 also notes that the mill operated as a cotton manufacturer (Kelly's Directories Ltd 1907). During the decline of the cotton trade in the mid-20th century, Fothergill & Harvey diversified into producing synthetic fabrics such as glass and carbon fibre, whilst also creating products under the trading name of 'Tygaflor' [also referred to as 'Tygan', 'Tyglas', 'Tygadure'] at Rock Nook Mill and other mills around Littleborough, including Sladen Wood Mill, detailed in Section 1.5 below (MBA Ltd 2020). The company conducted business in the manufacturing of synthetic materials which were advertised as moth-proof, waterproof, and resistant to 'acids, alkalis, alcohol and many other organic solvents' (Plate 6). The reports and accounts of Fothergill & Harvey from 1980, available from Companies House, further describe the materials manufactured under the 'Tygaflor' trademark, including fluorocarbon-based products and advanced composite materials (Fothergill & Harvey Ltd 1980).

The gradual expansion of the business is reflected in historic mapping and aerial photographs throughout the 20th century. Between the OS maps of 1893 and 1911, the site underwent expansion to the south, following the trajectory of the Rochdale Canal (Plates 2–3). By the publication of the 1930 OS map, new buildings had been constructed to the southeast of the site. Further expansion southeast occurred during the mid-20th century, reflected on the OS Plan of 1963 (Plate 5). It is noted that the company built across the Rochdale Canal when the canal officially closed to traffic in 1952, and that after the reopening of the canal 50 years later these features were removed (Evans 2023). Aerial photographs taken as part of the Greater Manchester Textile Mills Survey of 1985–6 reflect this, showing part of the canal covered with concrete, resulting in the surrounding area of the canal drying out (GMHER Ref: SF316348).

Adjacent to east of the former Rock Nook Mill buildings is the canal drain. As mentioned previously, this drain was likely constructed as a means of infilling the Rochdale Canal during its original construction and passes within the immediate vicinity to Sladen Mill (MBA Ltd 2020). By the 1980s aerial photography survey, it appears that much of this drain had dried out, but some water remained present towards the south of the site (GMHER Refs: SF316345 - SF316349).

The historical evidence consulted above describes the development of Rock Nook Mill over the course of its history. Functioning primarily as a cotton mill during its early history, the mill

later diversified into the production of synthetic fabrics under the direction of Fothergill & Harvey Group. The Group later formed the trademark name 'Tygaflor', producing fluorocarbon-based products and advanced composite materials at Fothergill & Harvey mills around Littleborough, including Rock Nook Mill. The mill itself was demolished in 2023 following concerns on public safety and the stability of the structure after it was subject to a destructive fire in 2015 (GMAAS 2024). However, the remaining buildings and structures at the site still form part of the Fothergill Engineered Fabrics Ltd premises today.

1.5 **Sladen Wood Mill**

Sladen Wood Mill is situated immediately north of Rock Nook Mill on the western side of the Rochdale Canal, around 880m northwest of the Site. This mill was also established by the group Fothergill & Harvey, who purchased the site containing a weaving shed adjacent to Punch Bowl Lock. The original weaving shed displays a plaque which reads "F & H Ltd. Built 1852 Rebuilt 1949" (GMHER 2024). In 1907, the mill is listed within the directory of cotton manufacturers under the name of 'Sladen Wood Mill Co', referencing the nearby Rock Nook and Greenvale mills (Kelly's Directories Ltd 1907). Following a similar business development as Rock Nook Mill during the 20th century, Sladen Wood Mill also diversified into the development of synthetic fabrics and fibreglass clothes, as described within the Cotton Spinners' and Manufacturers' Directory of 1962 (John Worrell Publishers 1962). The 1971 Lancashire Textile Industry directory provides an account of the workings of Fothergill & Harvey Ltd, comprising yarn preparation and sizing, the weaving of glass, nylon, "Terylene", saran, polyethylene and other man-made fibres, and the production of 'industrial fabrics for coating, filtration, reinforcement'. The directory also states that the group ran sites across Littleborough at Sladen Wood, Rock Nook, Greenvale, Ealees and Gale Mills (Thomas Skinner Directories 1971).

The most notable changes identifiable on historic mapping of this area occurred between the OS maps of 1851 and 1893, with the construction and establishment of Sladen Wood Mill during the mid to late 19th century. Some expansion occurred to the southern and northern extents of the mill between the 1911 and 1930 OS maps, however beyond this point very little change is discernible within the OS map of 1963. Aerial photographs from the 1980s show the site and its proximity to Rock Nook Mill, located south of Sladen Wood Mill. In the same way as the aerial photographs captured of Rock Nook Mill, images of Sladen Wood Mill show that the canal had been constructed over, which resulted in the immediate areas of the Rochdale Canal becoming dried out (GMHER Ref: SF316350 – SF316353).

Analysis of the available historical records and data concerning the practises undertaken at Sladen Wood Mill shows that Fothergill & Harvey were involved in the production and manufacturing of synthetic fibres, including fluorocarbon-based products and advanced composite materials (Fothergill & Harvey Ltd 1980). The site followed a similar development to the nearby Rock Nook Mill, producing cotton in the 19th century and later diversifying into synthetic and man-made fabrics during the 20th century. By 1999, the Sladen Wood Mill site was transformed into a business centre (GMAAS 2024). It appears that Fothergill & Harvey moved from the premises slightly south, where they remain under the trading name of Fothergill Engineered Fabrics Ltd at the former Rock Nook Mill site (Google Earth 2024).

1.6 Discussion

The historical evidence consulted within this Technical Note provides an insight into the manufacturing processes of the Site at Sladen Mill and the three other mills located within its vicinity, including: Wellfield Mill; Rock Nook Mill; and Sladen Wood Mill.

Historically, Sladen Mill and Wellfield Mill both operated under the Kershaw name and are recorded to have operated primarily as a cotton and wool manufacturers, diversifying into dyeing and bleaching from the mid-20th century onwards. The two mills operated by Fothergill & Harvey, Rock Nook Mill and Sladen Wood Mill, are recorded to have functioned as cotton spinning factories during the late 19th century, expanding their services to produce synthetic materials in the 20th century. These synthetic materials comprised the use of fluorocarbon-based products and advanced composite materials, which may have contained chemicals similar to those identified within geo-environmental investigations at the Client's Site (T J Booth Associates 2022).

A newspaper cutting from 1974 details an event which occurred at Greenvale Mill, one of the several Littleborough mills owned by Fothergill & Harvey. The article describes a fine issued to the company due to the release of pollutant materials into Lydgate Brook. The pollutant is reported to have entered the Brook and flowed downstream to Smithy Bridge. It is unclear which course of the Brook this pollutant took but, taking into consideration the flow of stream indicated on historic mapping (Plates 2–3), it is likely the pollution headed west from Greenvale Mill and south along the western side of the Rochdale Canal, instead of travelling upstream towards the Client's site at Sladen Mill. The pollutant comprised heating fuel oil which was reported to have 'escaped from a tank', and the company was ordered to pay £25 to cover the lawyer's fees (Rochdale Observer 1974).

1.7 Conclusion

This Technical Note was produced to provide a historical appraisal of the Site at Sladen Mill, in conjunction with three other mills located within the area of Littleborough: Wellfield Mill; Rock Nook Mill; and Sladen Wood Mill. It is important to note that Sladen Mill (the Site) and Sladen Wood Mill are two separate sites that historically functioned under two separate companies. Sladen Mill operated under the Kershaw Brothers, while Sladen Wood Mill was owned by the group Fothergill & Harvey. Although both sites originated within the cotton industry, the available historical evidence notes that Sladen Mill continued processing and manufacturing cotton, wool and flannel materials, introducing bleaching and dyeing processes during the mid to late 20th century. In comparison, the group Fothergill & Harvey diversified into the production of synthetic materials, comprising fluorocarbon-based products and advanced composite materials at their sites in Littleborough (comprising Rock Nook, Sladen Wood, Greenvale, Ealees and Gale Mills).

Although there has been no evidence yet identified which suggests the use of Per- and Polyfluoroalkyl substances (PFAS) and PFOS and PFOA chemicals at the Sladen Mill site, unless a full record of all imported and exported materials to and from the Site is available for examination, the historic evidence alone is not sufficient to explain the presence of these chemicals within deposits at the Site. It would be recommended that geo-environmental specialists are consulted for further advice and support.

This report was written in accordance with documents published by the Chartered Institute for Archaeologists (CIfA 2022).

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Appendix 1: Plates

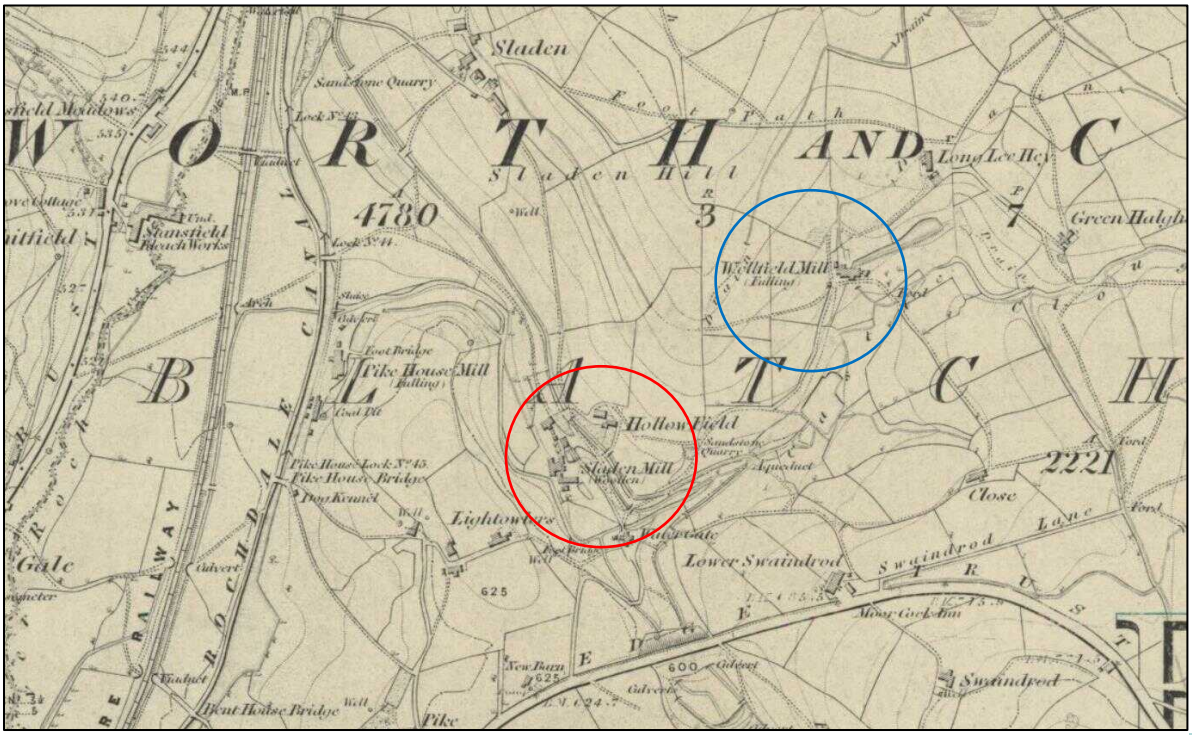


Plate 1: *Sladen Mill on the Lancashire Map of 1851, indicated in red. Wellfield Mill indicated in blue. Reproduced with the permission of the National Library of Scotland (2024)*

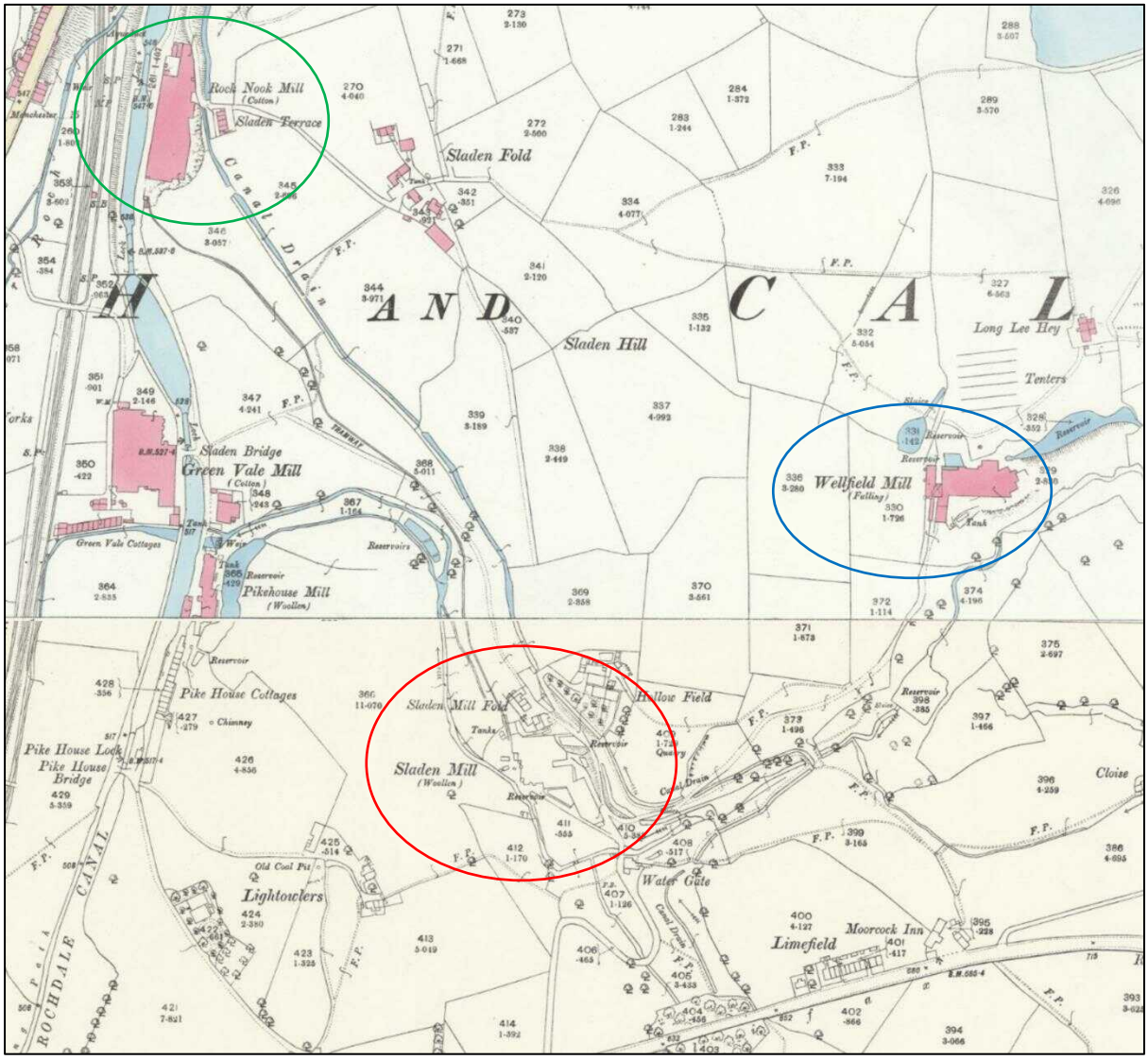


Plate 2: *Sladen Mill on the First Edition OS Map of 1893, indicated in red. Wellfield Mill indicated in blue, and Rock Nook Mill in green. Reproduced with the permission of the National Library of Scotland (2024)*

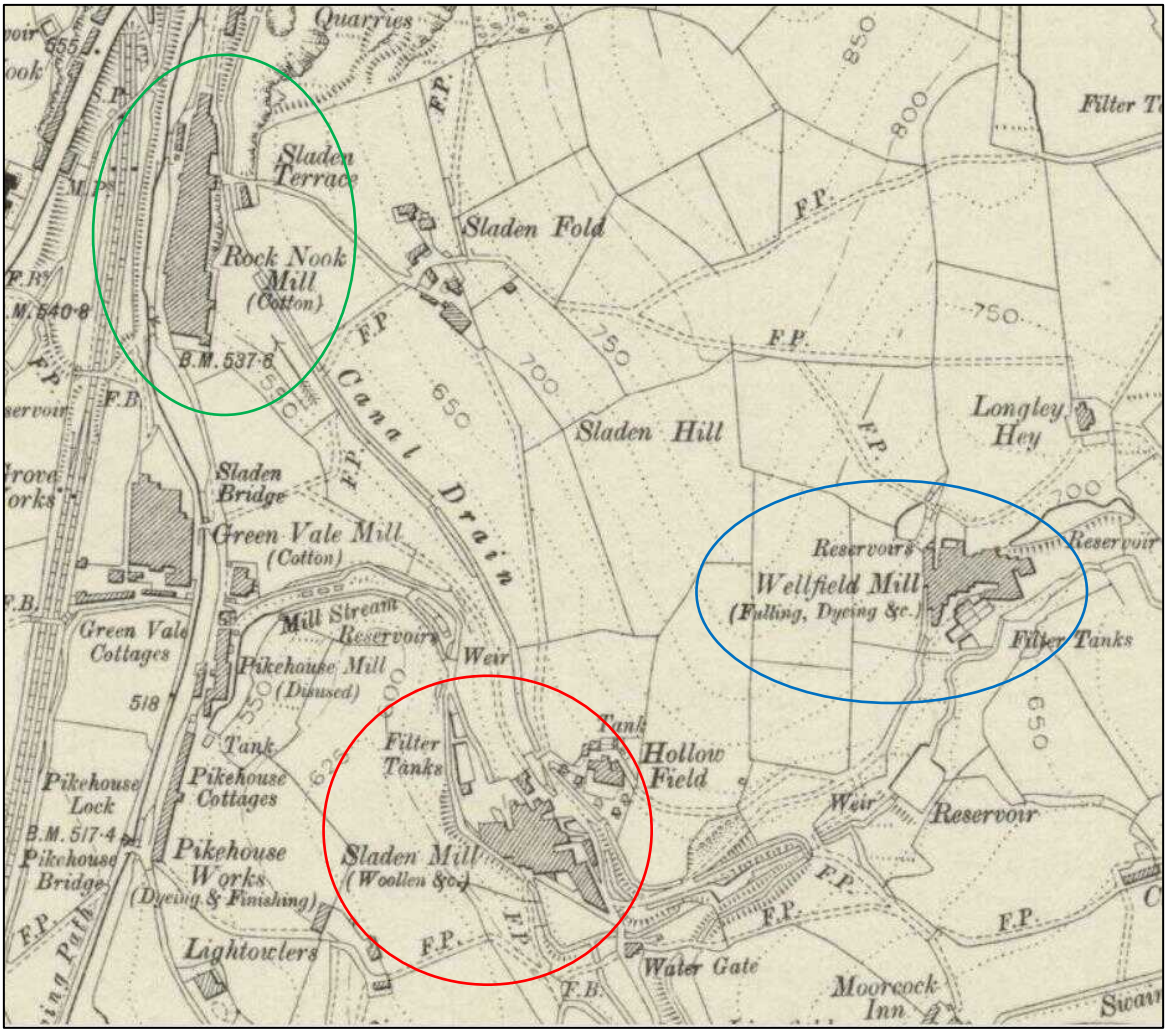


Plate 3: *Sladen Mill on the OS Map of 1911, indicated in red. Wellfield Mill indicated in blue, and Rock Nook Mill in green. Reproduced with the permission of the National Library of Scotland (2024)*

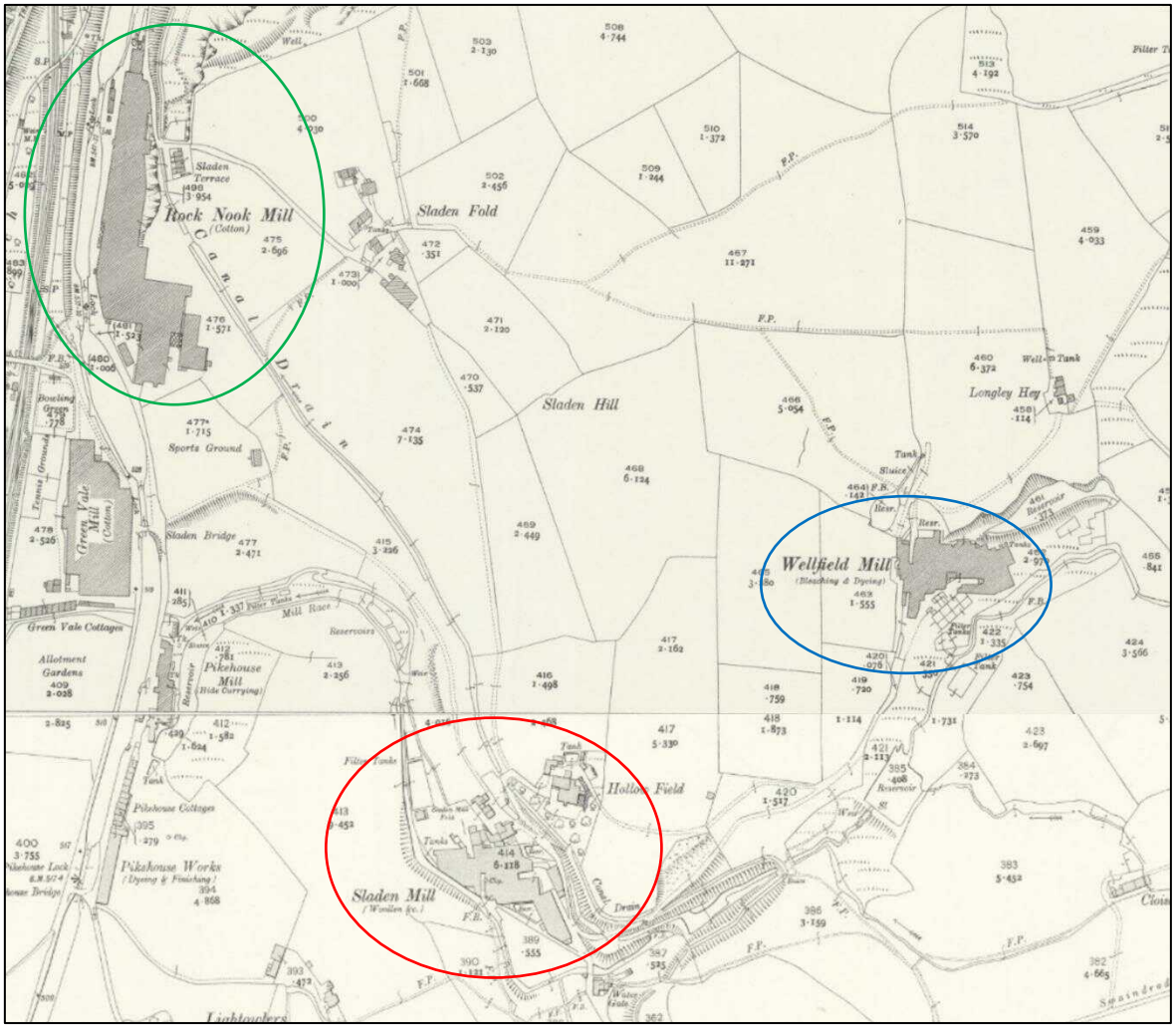


Plate 4: *Sladen Mill depicted on the OS Map of 1930, indicated in red. Wellfield Mill indicated in blue, and Rock Nook Mill in green. Reproduced with the permission of the National Library of Scotland (2024)*

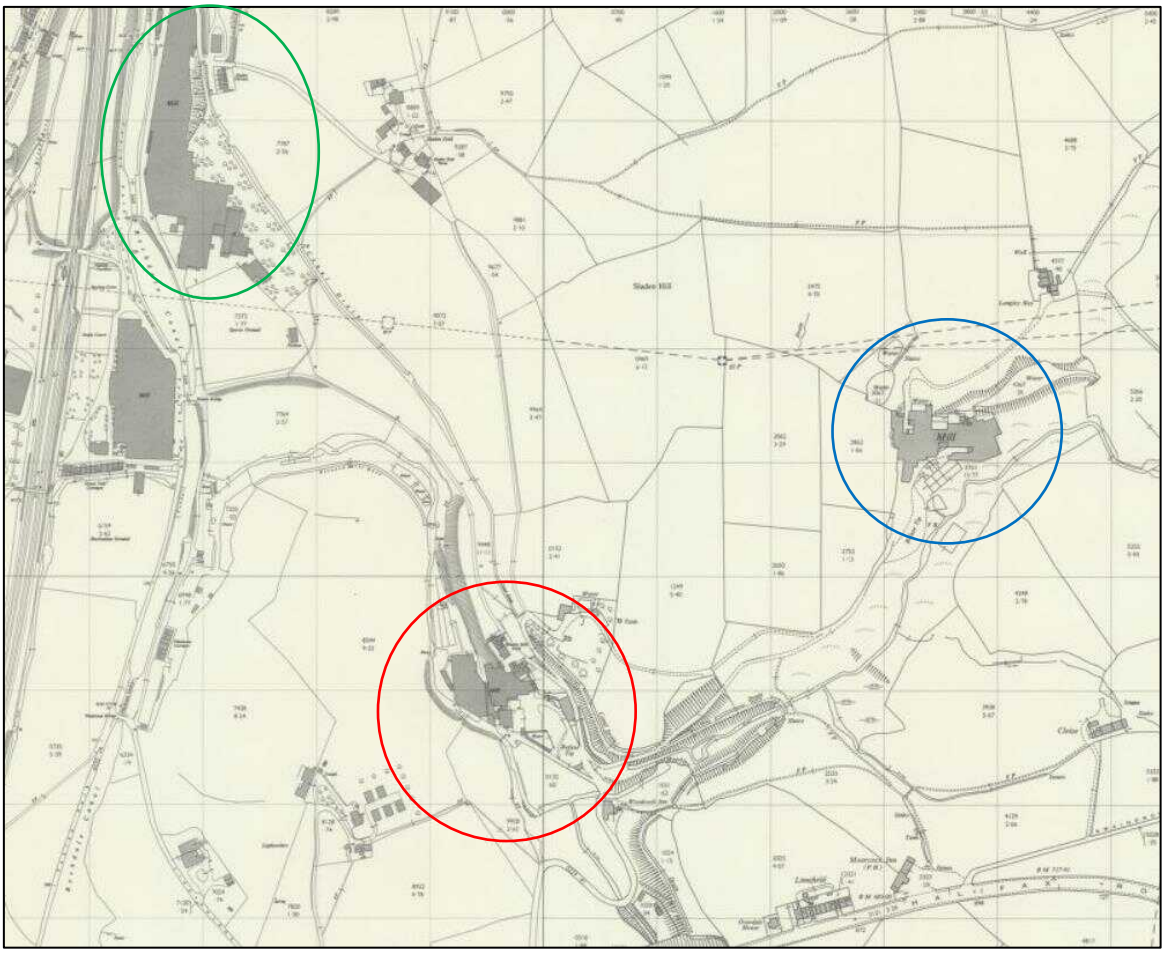


Plate 5: *Sladen Mill on the OS Plan of 1963, indicated in red. Wellfield Mill indicated in blue, and Rock Nook Mill in green. Reproduced with the permission of the National Library of Scotland (2024)*

Plate 6: *An advertisement in 1948 showcasing Fothergill & Harvey's material products. Image retrieved from Grace's Guides (2024)*

Drawing Issue Pack – Clarification of Groundwater and Site Level Changes

Project: Sladen Mill, Halifax Road, Littleborough, OL15 0LB

Prepared by: Mere Development Group

Issued to: Paul Nathanail

Date: 12 June 2023

1. Summary Note

This pack of drawings and documents has been compiled to demonstrate the relationship between ground-level changes during temporary construction phases and the recent appearance of two surface springs on site.

As shown in the attached documents:
- The original site levels were recorded in the May 2021 topographical survey submitted as part of the Reserved Matters application (21/00950/REM). These levels were higher across key areas of the site.
- During temporary works, levels were reduced in certain areas, particularly near the retaining wall. This resulted in the emergence of two temporary surface springs (Spring 1 and Spring 2), which were not present in the original ground conditions.
- The attached updated topographical survey (WCG 23-1954 Rev B) shows the springs appearing post-works.
- The annotated copy of the 2021 survey includes the location and current ground levels at both spring points for reference, highlighting the level change.
- The approved General Arrangement Plan (Rev6) confirms that upon completion, site levels will return to a higher state, reinstating the original ground conditions and thereby suppressing both springs, which will revert to groundwater.
- The accompanying Non-Material Amendment Decision Notice (ref: 24/01041/ANM) formally confirms approval of these revised levels by Rochdale Metropolitan Borough Council.

This pack is submitted to provide clear evidence that the surface springs are a temporary consequence of interim groundworks and will not persist once final site levels are implemented.

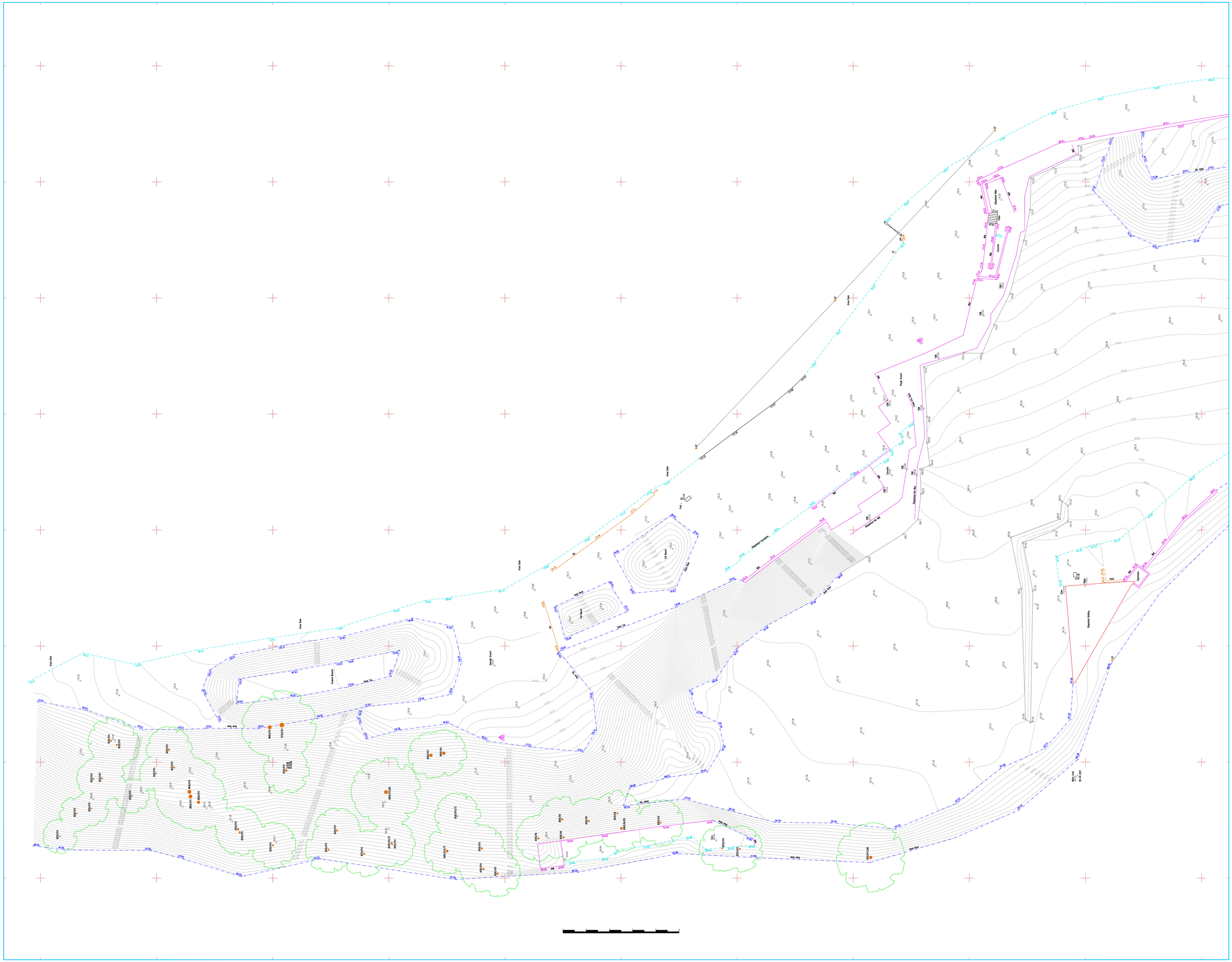
2. Drawing Register

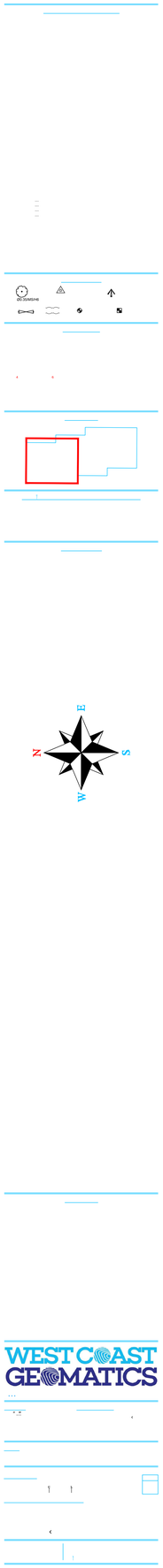
Ref No.	Drawing / Document Title	Drawing / Ref No.	Date / Rev	Purpose
1	Topographical Survey (Sheets 1–3)	WCG 21-1575-1:3 to 3:3	May 2021	Original topographical survey from Reserved Matters application (21/00950/REM). Downloaded from the planning portal. Demonstrates higher pre-works ground levels.
2	Updated 3D Topographical Survey (Sheets 1–2)	WCG 23-1954-T-1:2 to 2:2	Issued Oct 2023 Rev B: Jun 2025	Issued by Mere Development Group. Shows Spring 1 (Rev A) and Spring 2 (Rev B) emerging due to reduced levels during temporary works.
3	Updated Topographical Survey (Original Base with Spring References)	WCG 21-1575 (annotated version)	May 2021, annotated Jun 2025	Annotated version of original topo with positions and levels of Springs 1 and 2 added for reference. Demonstrates site level reductions.
4	General Arrangement Site Plan	DWG-TJBA-LUXURE-SLADEN MILL – 090621 Rev6	Rev6 – Approved Nov 2024	Approved finished levels as confirmed by Rochdale Council. Confirms springs will revert to groundwater

				post-completion.
5	Decision Notice – Non-Material Amendment Approval	24/01041/ANM	Issued 18 Nov 2024	Confirms planning approval of revised site layout and finished levels. Lists the GA Plan (Rev6) as an approved drawing.

Document 1 – Topographical Survey (May 2021)

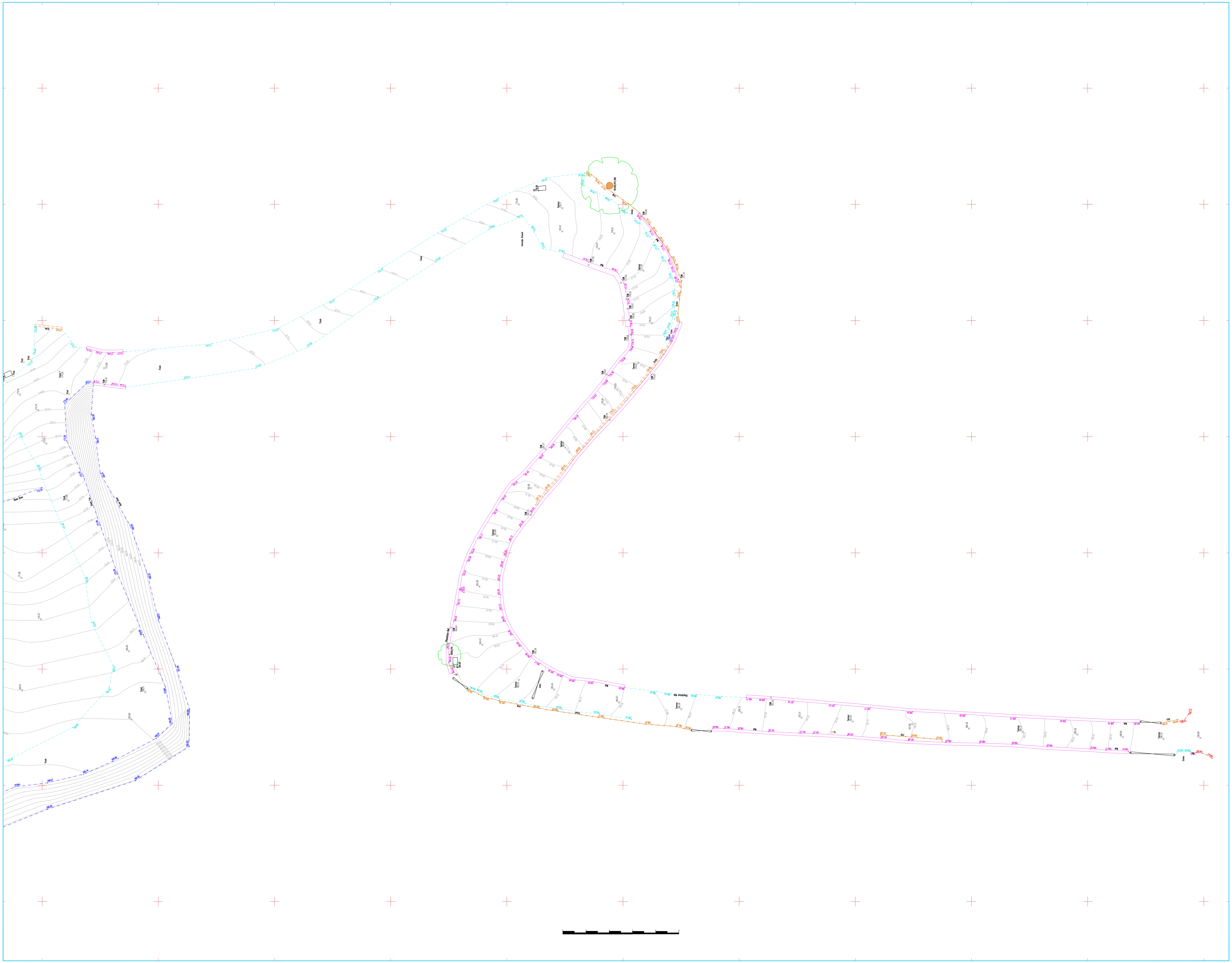
Title: Original Topographical Survey
Drawing No.: WCG 21-1575-1:3 to 3:3
Purpose:
Submitted as part of Reserved Matters application (21/00950/REM).
Represents original ground levels across the site prior to temporary works.

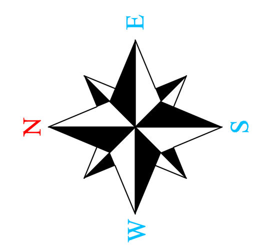




WEST COAST GEOMATICS

WEST COAST GEOMATICS





WEST COAST GEOMATICS

Document 2 – Updated 3D Topographical Survey (Rev B)

Title: Updated 3D Topographical Survey
Drawing No.: WCG 23-1954-T-1:2 to 2:2
Purpose:
Prepared by Mere Development Group.
Captures reduced site levels and shows emergence of Spring 1 and Spring 2 post-works.

STN4	395013.726	417247.881	183.526
STN1	395033.174	417343.936	174.881
STN3	394924.240	417480.719	175.579
R1	395000.460	417249.546	185.537
R2	395059.935	417366.458	187.907
R50	395017.472	417293.683	173.743
R51	394931.571	417325.665	188.874
R52	395028.881	417395.555	183.086
R53	394999.576	417423.153	183.205
R4	394949.823	417383.414	169.558
R5	394934.478	417382.177	169.391
R3	394950.908	417375.838	169.462

0.00 4.00 8.00 12.00 16.00 20.00

R52
E: 395028.881
N: 417395.555
Z: 183.086

R53
E: 394999.576
N: 417423.153
Z: 183.205

STN3
E: 394924.240
N: 417480.719
Z: 175.579

R4
E: 394949.823
N: 417383.414
Z: 169.558

R3
E: 394950.908
N: 417375.838

R5
E: 394934.478
N: 417382.177
Z: 169.391

Spring 1
Surface Running Water Surveyed Nov 2023

Spring 2
Surface Running Water Surveyed Nov 2023

Abbreviations where applicable:

AB	Air Brick	JTN	Junction Box
AV	Air Valve	KL	Keep Left
BB	Ballsha Beacon	KO	Kerb Gulley
BC	Bollard/Lamppy	LPS	Lamp Post
BH	Borehole	LVL	Level Point
BL	Bed Level	MB	Mooring Bollard
BM	Bench Mark	ME	Meter Manhole
BNDY	Boundary	MH	Manhole
BO	Blow Out	MK	Marker Post
BS	Bs/Stem (Tree)	MS	Multi-Stem (Tree)
BST	Bus Stop	MY	Mercury Manhole
BT	British Telecom Manhole	NP	Notice Board
BW	Brick Wall	NP	Road Name Plate
C	Cable	OH	Overhead
CCTV	Closed Circuit Television	OS	Ordnance Survey
CL	Ceiling Level	PB	Pillar Box
CONC	Concrete	PED	Pedestrian Pad
CP	Concrete Post	PI	Pipe
CR	Cattle Grid	PM	Parking Meter
CTV	Cable Television Manhole	PO	Post Office Manhole
CUL	Culvert	PP	Power Point
DP	Drop Kerb	RE	Rodding Eye
DR	Drain Pipe	RS	Road Sign
DPC	Damp Proof Course	RTW	Retaining Wall
DR	Drain	RWP	Rainwater Pipe
DWB	Dog Waste Bin	SDP	Stand Pipe
EB	Electric Box	SIG	Signal Box
ES	Electricity Manhole	SOF	Soffit Level
EP	Electricity Pole	SMH	Surface Water Manhole
ER	Earthing Rod	ST	Stop Tap
FB	Flower Bed	SU	Stump (Tree)
FCB	Fuse Cut Box	SV	Sluice Valve
FCL	False Ceiling Level	SVP	Soil Vent Pipe
FFL	Finished Floor Level	SW	Surface Water
FIR	Fence Iron Railing	SY	Stay (Eg. Pylon, TP)
FL	Floor Level	TBM	Temporary Benchmark
FMH	Foul Water Manhole	TCB	Traffic Control Box
FP	Flag Pole	TH	Threshold Level
FPC	Fence Post & Chain	TL	Traffic Light
FPH	Fence Post & Hedge	TOW	Top of Wall
FPR	Fence Post & Rail	TP	Telegraph Pole
FPW	Fence Post & Wire	TPT	Test Pit
FSB	Fence Safety Barrier	TS	Tri-Stem (Tree)
FW	Foul Water	TSI	Traffic Signal Manhole
FWM	Fence Wire Mesh	UC	Unidentified
GAS	Gas Valve	UTR	Unable To Raise
GL	Ground Level	VP	Vent Pipe
GP	Gate Post	WB	Waste Bin
GU	Gulley	WCL	Window Cill Level
HC	Hedge	WCL	Window Head Level
HY	Hydrant	WL	Wall Level
IS	Information Sign	WM	Water Meter

General Legend:

Tree | Survey Station | OSBM/TBM | Hedge | Borehole | Trial Pit

Survey Control:

Relative to Ordnance Survey grid via Active Network RTK GPS Plane Table Grid

Sheet Layout:

S1
S2

Disclaimer - West Coast Geomatics Limited 2023:

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Additional Notes:

Amendments:

Rev A: January 2024
Additional Levels Added to Survey and Contours Updated

Rev B: June 2025
Re-Surveyed to Show Location of Spring 2

WEST COAST GEOMATICS
LAND & MEASURED BUILDING SURVEYORS

Address:
Suites 3 & 4 Orchard House
Hallsall Business Centre
Lancashire
L39 8RG

Contact details:
Tel.: +44 (0) 1704 840 938
Email: info@wcgeo.co.uk
Web: www.wcgeo.co.uk

Client:
Mere Development Group

Drawing Title:
3D Topographical Survey Sheet 1 of 2

Rev: A

Site Address / Project Reference:
Sladen Mill
Todmorden Road
Littleborough - OL15 9EW

Surveyed:	JJD	Document No.	WCG 23-1954-T-1-2
Processed:	JJD	Plotted Scale:	ISO_A0_@ 1:100
Checked & QA:	SN	Date of Issue	October 2023

0.00 4.00 8.00 12.00 16.00 20.00

R2
E: 395059.935
N: 417366.458
Z: 187.907

STN1
E: 395033.174
N: 417343.936
Z: 174.881

R52
E: 395028.881
N: 417395.555
Z: 183.086

R53
E: 394999.576
N: 417423.153
Z: 183.205

STN4
E: 395013.726
N: 417247.881
Z: 183.526

R50
E: 395017.472
N: 417293.683
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E: 395000.460
N: 417249.546
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R4
E: 394949.823
N: 417383.414
Z: 169.558

R3
E: 394950.908
N: 417375.838
Z: 169.462

R51
E: 394931.571
N: 417325.665
Z: 188.874

STN4	395013.726	417247.881	183.526
STN1	395033.174	417343.936	174.881
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R1	395000.460	417249.546	185.537
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R5	394934.478	417382.177	169.391
R3	394950.908	417375.838	169.462

Abbreviations where applicable:

AB	Air Brick	JTN	Junction Box
AV	Air Valve	KL	Keep Left
BB	Ballsha Beacon	KO	Kerb Gulley
BC	Boundary Canopy	LP	Lamp Post
BH	Borehole	LV	Litter Bin
BL	Bed Level	MB	Mooring Bollard
BM	Bench Mark	ME	Meter Manhole
BNDY	Boundary	MH	Manhole
BO	Bollard	MK	Mark
BS	Bi-Stem (Tree)	MS	Multi-Stem (Tree)
BST	Bus Stop	MY	Mercury Manhole
BT	British Telecom Manhole	NP	Notice Board
BW	Brick Wall	NP	Road Name Plate
C	Channel	OB	Outbuilding
CCTV	Closed Circuit Television	OS	Ordnance Survey
CL	Ceiling Level	PB	Pillar Box
CONC	Concrete	PED	Pedestrian Pad
CP	Concrete Post	PI	Pipe
CR	Cattle Grid	PM	Parking Meter
CTV	Cable Television Manhole	PO	Post Office Manhole
CUL	Culvert	PP	Power Point
DP	Drop Kerb	RL	Road Level
DR	Drain Pipe	RS	Road Sign
DPC	Damp Proof Course	RTW	Retaining Wall
DR	Drain	RWP	Rainwater Pipe
DWB	Dog Waste Bin	SDP	Stand Pipe
EB	Electric Box	SIG	Traffic Signal
ES	Electricity Manhole	SOI	Soffit Level
EP	Electricity Pole	SMH	Surface Water Manhole
ER	Earthing Rod	ST	Stop Tap
FB	Flower Bed	SU	Stump (Tree)
FE	Fire Extinguisher	SV	Sluice Valve
FCL	False Ceiling Level	SVP	Soil Vent Pipe
FFL	Finished Floor Level	SW	Surface Water
FIR	Fence Iron Railing	SY	Stay (Eg. Pylon, TP)
FL	Floor Level	TBM	Temporary Benchmark
FMH	Foul Water Manhole	TEL	Telephone Point
FP	Flag Pole	TH	Threshold Level
FPC	Fence Post & Chain	TL	Traffic Light
FPH	Fence Post & Hedge	TOW	Top of Wall
FPR	Fence Post & Rail	TP	Telegraph Pole
FPW	Fence Post & Wire	TPT	Test Pit
FSB	Fence Safety Barrier	TS	Tri-Stem (Tree)
FW	Foul Water	TSI	Traffic Signal Manhole
FWM	Fence Wire Mesh	UC	Under Croft
GAS	Gas Valve	UTR	Unable To Raise
GL	Ground Level	VP	Vent Pipe
GP	Gate Post	WB	Waste Bin
GU	Gulley	WCL	Window Cill Level
HH	Hedge	WCL	Window Head Level
HY	Hydrant	WL	Wall Level
IS	Information Sign	WM	Water Meter

General Legend:

Tree (20.5/MS/HE) · Survey Station · OSBM/TBM · Gate · Hedge · Borehole · Trial Pit

Survey Control:

Relative to Ordnance Survey grid via Active Network RTK GPS
Plane Table Grid

Sheet Layout:

S1
S2

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Additional Notes:

Amendments:

Rev A: January 2024
Additional Levels Added to Survey and Contours Updated

Rev B: June 2025
Re-Surveyed to Show Location of Spring 2

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L39 8RG

Contact details:
Tel: +44 [0] 1704 840 938
Email: info@wcgeo.co.uk
Web: www.wcgeo.co.uk

Client:
Mere Development Group

Drawing Title:
3D Topographical Survey Sheet 2 of 2

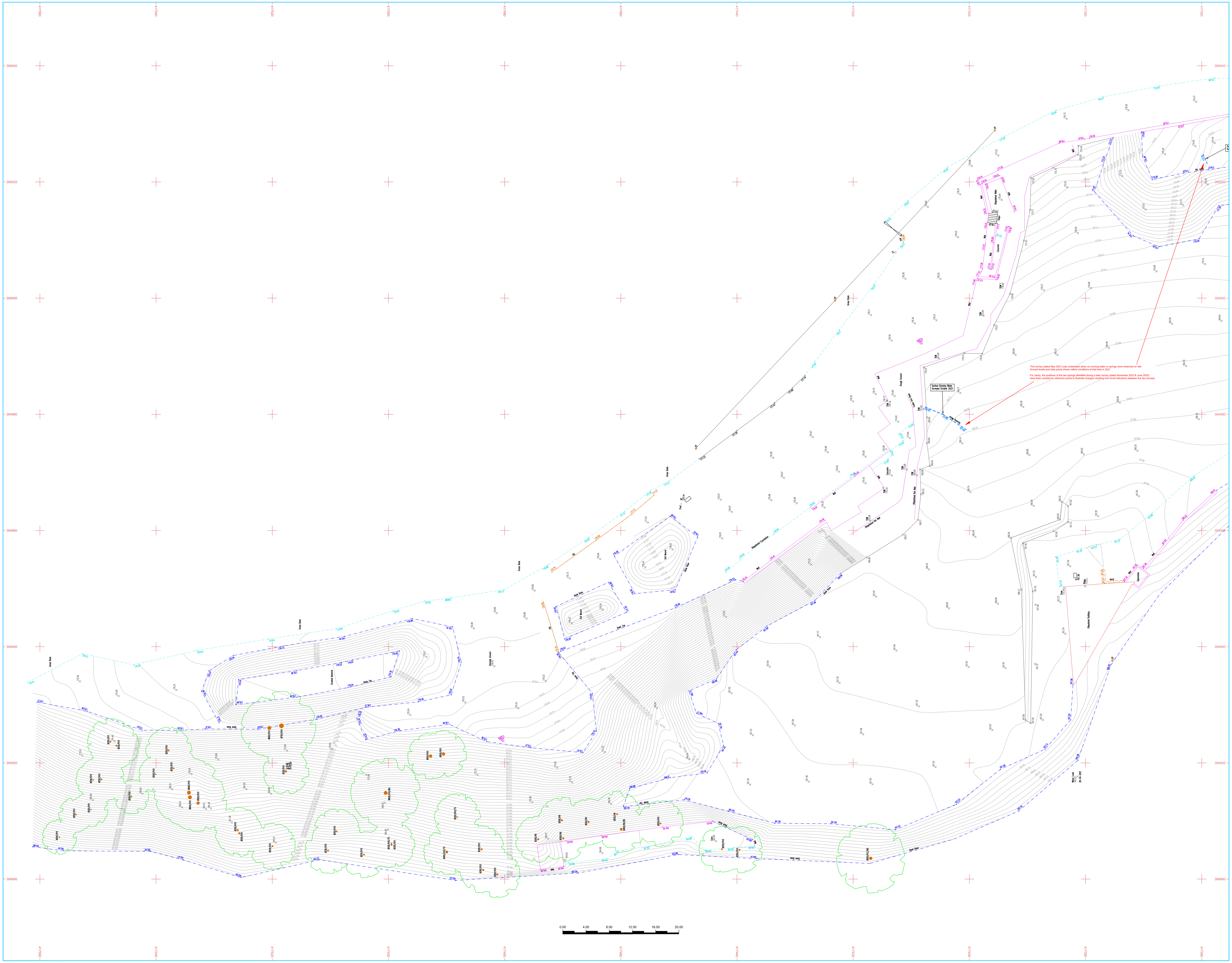
Rev: A

Site Address / Project Reference:
Sladen Mill
Todmorden Road
Littleborough - OL15 9EW

Surveyed:	JJD	Document No.	WCG 23-1954-T-2-2
Processed:	JJD	Plotted Scale:	ISO_A0_@ 1:100
Checked & QA:	SN	Date of Issue	October 2023

Document 3 – Annotated Version of Original Survey

Title: Annotated Topographical Survey (Reference Update)
Drawing No.: WCG 21-1575 (annotated version)
Purpose:
Original survey annotated to mark the location and current levels of both springs.
Demonstrates site level changes and confirms the springs are temporary.



Abbreviations where applicable:

AB	Air Brick	JTN	Junction Box
AV	Air Valve	KL	Keep Left
BB	Belisha Beacon	KO	Kerb Gulley
BC	Building Canopy	LFB	Lifebuoy
BH	Borehole	LP	Lamp Post
BL	Bed Level	MB	Mooring Bollard
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BO	Bollard	MK	Marker
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BW	Brick Wall	NP	Road Name Plate
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CONC	Concrete	PED	Pedestrian Pad
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CR	Cycle Rack	PM	Parking Meter
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DWB	Dog Waste Bin	SDP	Stand Pipe
EB	Electricity Box	SK	Soakaway
EL	Electricity Manhole	SOF	Soffit Level
EP	Electricity Pole	SMH	Surface Water Manhole
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FB	Flower Bed	SU	Stump (Tree)
FBR	Foot Bridge	SV	Stop Valve
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FFL	Finished Floor Level	SW	Surface Water
FIR	Fence Iron Railing	SY	Stay (Eg. Pylon, TP)
FL	Floor Level	TBM	Temporary Benchmark
FMH	Foul Water Manhole	TCB	Telephone Call Box
FP	Flag Pole	TH	Threshold Level
FPC	Fence Post & Chain	TL	Traffic Light
FPP	Fence Post & Panel	TOW	Top of Wall
FPR	Fence Post & Rail	TP	Telegraph Pole
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FWM	Fence Wire Mesh	U/B	Under Beam
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GP	Gate Post	WB	Waste Bin
GU	Gulley	WCL	Window Cill Level
H	Height	WHL	Window Head Level
HY	Hydrant	W/L	Wall Level
IS	Information Sign	WM	Water Meter

General Legend:

Tree Ø0.35/MS/H6 — Survey Station STNX — OSBM/TBM — Gate — Hedge — Borehole — Trial Pit

Survey Control:

	-E/X-	-N/Y-	-Ht/Z-
STN1	395033.174	417343.936	174.881
STN2	394992.653	417408.696	178.204
STN3	394924.240	417480.719	175.579
STN4	395013.726	417247.881	183.526

Relative to Ordnance Survey grid via Active Network RTK GPS Plane Table Grid

Sheet Layout:

S1 S3

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Additional Notes:

Amendments:

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Address:
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L39 8RG

Contact details:
Tel: +44 [0] 1704 840 938
Email: info@wcgeo.co.uk
Web: www.wcgeo.co.uk

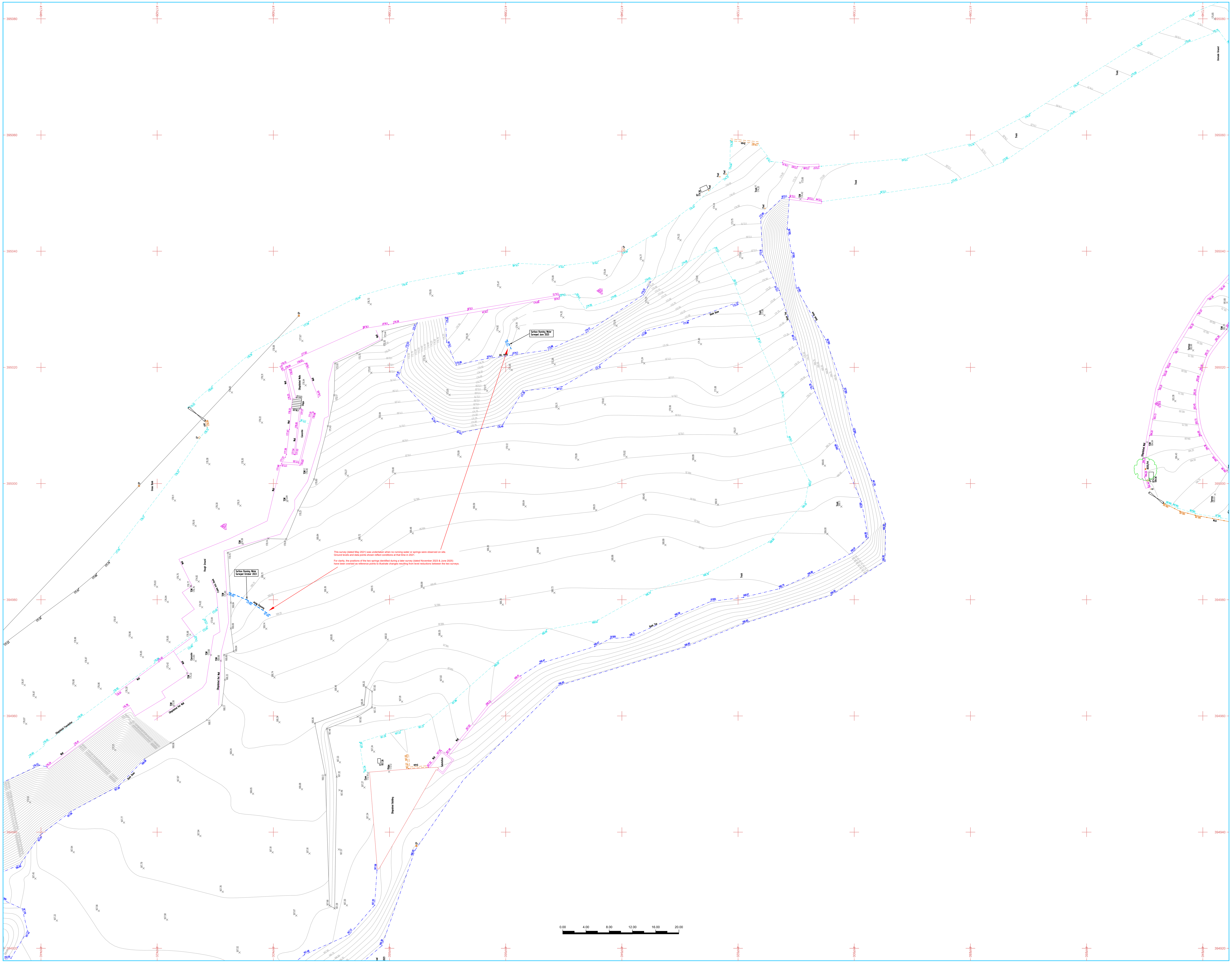
Client:
Mainly Mere

Drawing Title:
Topographical Survey - Sheet 1 of 3

Rev: -

Site Address / Project Reference:
Sladen Mill
Todmorden Road
Littleborough - OL15 9EW

Surveyed:	JJD	Document No.	WCG 21-1575-1:3
Processed:	JD	Plotted Scale:	ISO_A0_@_1:200
Checked & QA:	SN	Date of Issue	May 2021



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Relative to Ordnance Survey grid via Active Network RTK GPS
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Sheet Layout:

S2

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Additional Notes:

N E S W

Amendments:

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Contact details:
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Web: www.wcgeo.co.uk

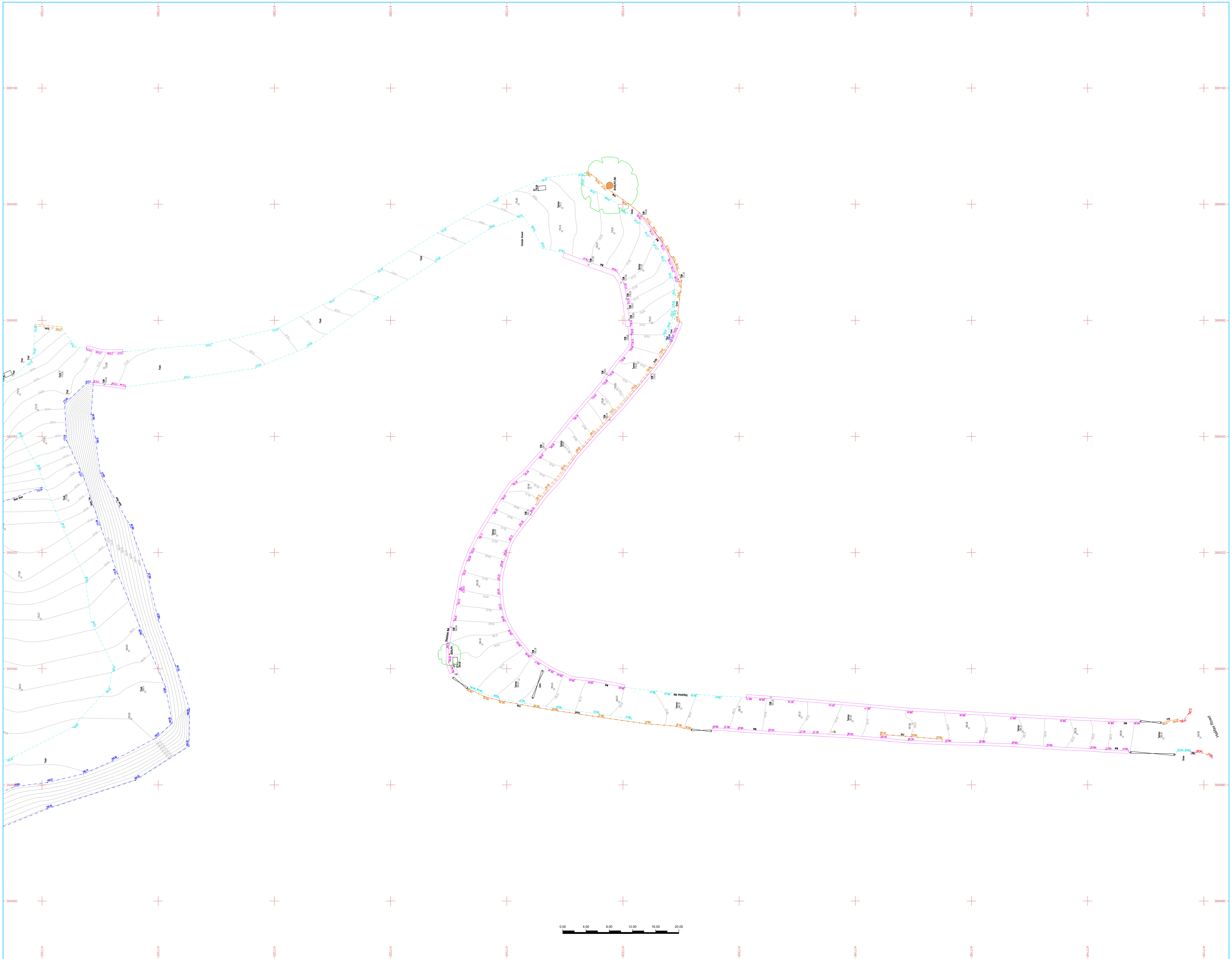
Client:
Mainly Mere

Drawing Title:
Topographical Survey - Sheet 2 of 3

Rev: -

Site Address / Project Reference:
Sladen Mill
Todmorden Road
Littleborough - OL15 9EW

Surveyed:	JJD	Document No.	WCG 21-1575-2:3
Processed:	JD	Plotted Scale:	ISO_A0_@_1:200
Checked & QA:	SN	Date of Issue	May 2021



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GAS	Gas Valve	UTR	Unable To Raise
GL	Ground Level	VP	Vent Pipe
GP	Gate Post	WB	Waste Bin
GU	Gulley	WCL	Window Cill Level
H	Height	WHL	Window Head Level
HY	Hydrant	W/L	Wall Level
IS	Information Sign	WM	Water Meter

General Legend:

Tree Ø0.35/MS/H6 — Survey Station STNX — OSBM/TBM — Gate — Hedge — Borehole — Trial Pit

Survey Control:

	-E/X-	-N/Y-	-Ht/Z-
STN1	395033.174	417343.936	174.881
STN2	394992.653	417408.696	178.204
STN3	394924.240	417480.719	175.579
STN4	395013.726	417247.881	183.526

Relative to Ordnance Survey grid via Active Network RTK GPS Plane Table Grid

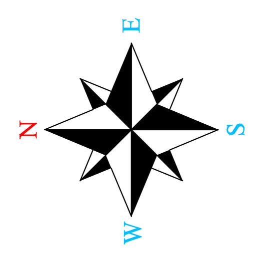
Sheet Layout:

S1 S3

Disclaimer - West Coast Geomatics Limited 2021:

This survey has been produced with its accuracy consummate with the indicated scale and should only be used for its original intended purpose. Any scaling should only be undertaken using a stable media print produced using the original data. No responsibility is accepted to any third party for the whole or part of its contents. All data remains in the ownership of West Coast Geomatics Limited. Any discrepancies between this survey and any other information should be reported to West Coast Geomatics Limited.

Additional Notes:



Amendments:

WEST COAST GEOMATICS
LAND & MEASURED BUILDING SURVEYORS

Address:
Suites 3 & 4 Orchard House
Halsall Business Centre
Lancashire
L39 8RG

Contact details:
Tel: +44 [0] 1704 840 938
Email: info@wcgeo.co.uk
Web: www.wcgeo.co.uk

Client:
Mainly Mere

Drawing Title: Rev: -
Topographical Survey - Sheet 3 of 3

Site Address / Project Reference:
Sladen Mill
Todmorden Road
Littleborough - OL15 9EW

Surveyed:	JJD	Document No.	WCG 21-1575-3:3
Processed:	JD	Plotted Scale:	ISO_A0_@_1:200
Checked & QA:	SN	Date of Issue	May 2021

Document 4 – General Arrangement Site Plan (Rev6)

Title: Approved General Arrangement Plan
Drawing No.: DWG-TJBA-LUXURE-SLADEN MILL – 090621 Rev6
Purpose:
Approved finished levels as per planning approval.
Demonstrates that surface springs will be reabsorbed as groundwater post-completion.

planning/tender

T J BOOTH ASSOCIATES CONSULTING CIVIL & GEOTECHNICAL ENGINEERS			20A Eastgate Street Rochdale Lancashire OL16 1DH Tel:01706 868288

Luxure Developments / Sladen Mill, Littleborough

general arrangement site plan

FILE NAME: dwg-tjba-luxure-sladen mill-090621

SCALE: 1 : 250 @ A1

AMENDMENTS/ ISSUES

REVISION	REASON/ CHANGE	DATE	BY
6	plot 11 ffl to 171.40	sept 2024	ds
5	path & ret walls to plots 5-8 & 16	jul 2024	ds
4	prop extnl & prop lvls site wide	jun 2024	ds
3	update topo, bridge topo added, plan amended, tender issue	mar 24	tjb
2	update topo added & plan amended	oct 23	tjb
1	plots, earthworks & road layout updated	aug 23	tjb
0	original	jun 23	tjb

Document 5 – NMA Decision Notice (24/01041/ANM)

Title: Decision Notice – Non-Material Amendment
Reference: 24/01041/ANM
Purpose:
Confirms that the revised General Arrangement Plan (Rev6) has been formally approved by Rochdale Council.
Provides planning context and authorisation for final site levels.

ROCHDALE BOROUGH COUNCIL

Town and Country Planning Act 1990 (as amended)

NON MATERIAL AMENDMENT TO EXISTING PLANNING PERMISSION

APPLICATION REFERENCE: 24/01041/ANM

Name and address for correspondence:	Applicant name:
Mr Paul Ambrose R&R Planning Consultants 11 Bankfield Lane Rochdale OL11 5RJ	Ben James

Part I - Particulars of Application

Date of Application: 21 October 2024

Proposal:	**Non-material amendment to planning permission 21/00950/REM for alterations to the vehicular access and parking layout for plots 1-8, amendments to plots 16, 17 and 18 and amendments to private footpaths which serve plots 1-8**
Location:	**Sladen Mill , Halifax Road, Littleborough, Rochdale, OL15 0LB**

Part II - Particulars of decision

The Rochdale Metropolitan Borough Council hereby give notice in pursuance of the provisions of the Town and Country Planning Act 1990 (as amended) that the revised details listed in Part I above have been approved as a non-material amendment to the existing planning permission.

The Council hereby **GRANTS** the above development in accordance with the revised details as stated on the application form subject to the following conditions and reasons:

Conditions and Reasons:

2 This permission relates to the following plans:-

PL01 Location Plan
General Arrangement Site Plan - dwg-tjba-luxure-sladen mill - 090621 Rev6
PL03 Existing Levels Rev. G
PL04 Existing and Proposed Levels Rev. G
PL05 Wider Context Plan Rev. E
PL06 Site Sections 1-3 Rev. L
PL07 Site Sections 4-6 Rev. K
PL08 Site Sections 7-9 Rev. M
PL09 Site Sections 10-11 Rev. L
PL14 Sections 14-15 Rev. J
PL15 Site Section Location Plan (incl. accommodation schedule and levels)

PL16 External Works Rev. D
PL20 Plot 1-8 Rev. B
PL21 Plot 9 & 10 Rev. C
PL22 Plot 11 Rev. B
PL23 Plot 13 Rev. D
PL24 Plot 14 Rev. B
PL25 Plot 16 Rev. D
PL26 Plots 14, 15 Front Elevations & 16 Side Elevations Rev. E
PL27 Plots 14, 15 Rear Elevations & 16 Side Elevations Rev. G Page 2 of 7
PL28 Plot 17 Rev. D
PL29 Plot 18 and 20 Rev. B
PL30 Plot 19 Rev. B
PL31 Plot 21 and 22 Rev. C
PL32 Plot 23 Rev. B
PL33 Plot 24 Rev. B
PL34 Plot 25 Plans Rev. D
PL35 Plot 25 Side Elevations Rev. D
PL36 Proposed Ownership Boundaries Rev. A
UG_1404_LAN_SL_DRW_04 Soft Landscape Plan Sheet 1 of 2 P10
UG_1404_LAN_SL_DRW_05 Soft Landscape Plan Sheet 2 of 2 P09

and the development shall be carried out in complete accordance with these drawings hereby approved.

Reason: For the avoidance of doubt and to ensure a satisfactory standard of development in accordance with the policies contained within the adopted Rochdale Core Strategy, the saved Rochdale Unitary Development Plan and the National Planning Policy Framework.

Date Decision Issued 18 November 2024

Melanie Hale
Head of Planning Services

IMPORTANT

PLEASE ENSURE THAT YOU HAVE READ AND FULLY UNDERSTOOD THE CONTENTS OF THIS DECISION NOTICE.

INFORMATIVE:
The Local Planning Authority's reasons for its decision are set out in the accompanying officer's report.

INFORMATIVE:
This decision notice is to be read alongside that issued with planning permission 21/00950/REM and all conditions that were imposed on all previous applications and amendments, with the exception of those conditions which are explicitly varied in accordance with the provisions of this decision or which have been explicitly varied by way of other S96A non-material amendments.