T J BOOTH ASSOCIATES

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

GEO-ENVIRONMENTAL AUDIT

PHASE 2 Site Investigation & Risk Assessment

PHASE 3 Remediation Statement

Proposed Residential Development

Former Albert Mill

Whitworth

Rochdale

Author: Daniel Slattery

Client: J A Yates

Reference: rep-tjba-JAY-albert mill-Phs 2+3 Env-170423

Revision	Date	Reason
0	April 2023	Original.

T J Booth Associates.

20A Eastgate St,

Rochdale,

Lancs,

OL16 1DH.

Tel: 01706 868288.

Email: office@tjba.co.uk

T J BOOTH ASSOCIATES

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

GEO-ENVIRONMENTAL AUDIT

PHASE 2 Site Investigation & Risk Assessment

PHASE 3 Remediation Statement

Proposed Residential Development

Former Albert Mill

Whitworth

Rochdale

CONTENTS:

1. PHASE 2 - SITE INVESTIGATION & RISK ASSESSMENT

1.1. Introduction.

T. J. Booth Associates have been appointed by J A Yates Ltd to undertake a Phase 2 & 3 Geo-environmental Audit & associated Site investigations to the former Albert Mill Site, to support a Town & Country Planning permission for a residential end use.

The Site was previously occupied by textile mills & later general engineering works. Historical records indicate the Site has been used for industrial purposes since around 1850, with multiple phases of redevelopment being undertaken between then and the present day.

The current pre-development Site comprised predominantly masonry buildings and steel frame/clad warehouses & storage buildings.

Planning approval (Full) for the Site was granted in November 2020 under planning application ref: 2019/0341; for the 'Demolition of existing building and erection of 37 no. dwellings and 48 apartments for the over 55s (48 x 2 beds, 24 x 3 beds, and 13 x 4 beds), with associated works.'

A Phase I Preliminary Risk Assessment (PRA) was undertaken by Wormseye Geotechnical Ltd in 2018 to support the above planning application, report reference: Albert Street/OL12 8PJ/2018. The Wormseye PRA was itself an update of an earlier Geo-Environmental Desk Study by Scott Hughes Design in 2012 which was used for earlier design & applications.

The 2019/0341 planning permission notice comprises pre-commencement conditions No.29 & 30, related to land contamination, and are detailed below:

> 29. Notwithstanding any information submitted with the application, no development shall take place (except for demolition and enabling works as agreed with the LPA) until an investigation and risk assessment has been submitted to and approved in writing by the Local Planning Authority. The submitted report shall include:
>
> i) Where potential risks are identified by the Preliminary Risk Assessment, a Phase 2 Site investigation report shall also be submitted to and approved in writing by the Local Planning Authority prior to commencement of development. The investigation shall address the nature, degree and distribution of land contamination on site and shall include an identification and assessment of the risk to receptors focusing primarily on risks to human health, groundwater and the wider environment; and
>
> ii) Should unacceptable risks be identified the applicant shall also submit and agree with the Local Planning Authority in writing a contaminated land remediation strategy prior to commencement of development.
>
> The development shall thereafter be carried out in full accordance with the duly approved remediation strategy or such varied remediation strategy as may be agreed in writing with the Local Planning Authority.
>
> Reason: To ensure the development does not pose a risk of pollution.
>
> 30. Pursuant to condition 29 and prior to first occupation of any of the dwellings hereby approved, a verification report, which validates that all remedial works undertaken on site were completed in accordance with those agreed with the Local Planning Authority, shall be submitted to and approved in writing by the Local Planning Authority.
>
> Reason: In the interests of mitigating hazards associated with contamination and to prevent pollution.

This report provides a desk-based study & intrusive ground investigation based on current UK guidance for environmental investigation within the construction industry. Principal to the assessment is the potential for contamination pollutant linkages via the CLR-11 source-pathway-receptor methodology. Assessment of potential pollution linkages is primarily undertaken in strict accordance with BS5930:2015, BS10175:2011+A2:2017, CIRIA C665, and BS 8485:2015+A1:2019 et al.

1.2. Proposed Development.

The proposed development is for the erection of 37No. dwellings and 48No. apartments. The dwellings are to have driveways and rear garden areas. The proposed apartments are proposed to have an undercroft/garage parking areas.

The Site is located at the bottom of the Market Street highway retaining wall and thus a new access road will be created into the Site which bridges the difference in level of approximately 9m.

As part of the proposal, Site levels are to be increased by 2-3m (under appropriate licences to be obtained from the Environment Agency), to bring the Site in level with the surrounding land to the north & west sides, and lessening the level difference to the east side highway retaining wall.

The partially culverted river channel will also be rerouted through the Site, providing a wildlife corridor to the south side with new green slope embankments down to the river bed.

Refer to Proposed Site Plan in the Appendix.

1.3. Detailed Site History.

Refer to Appendix for Landmark historical maps.

1851. Historic records show the Site was open agricultural land with the River Spodden flowing through in its original and untouched alignment. The only potential contaminative features noted are a gasometer nominally 80m west & tenter fields to the southwest nominally up to the Site boundary.

There is a weir to the south just offsite creating a mill race to the Massey Croft Woollen Milll to the southwest. The map also shows Ranger Sike, a tributary of the Spodden from the east, culverted beneath Market Street and joining the Spodden offsite to the south. Development is sparse in the wider area.

1891-93. Albert Mill (cotton) now occupies the southeast corner of the Site, built over the River Spodden. To the southwest side of the Site (south bank of the Spodden), a new reservoir is also noted. The Site chimney is located across Market Street adjacent to what would become Coppice Drive, although it is not yet labelled on the plans. Adjacent to the west perimeter, the Whitworth branch line railway runs nominally north-south. Development along Market Street

1910. Expansion of the mill with extensions to the north side. A tank is noted within a yard surrounded by the mill buildings.

To the north of the mill buildings and between the new terraced dwellings on Albert Street, land contour lines suggest there is benching of the land – assumedly to level it out. Part of the benching is shown to have been formed by infill/made ground.

1929. Further infill is now noted up to the north Site boundary. Chimney now labelled on plans across Market Street. Albert Mill is noted as disused.

1964. By this time period, the south side of the mill (much of the original mill building) has been demolished and left as external hardstanding. To the west side of the mill (north bank of the Spodden), there are some outlines which could either represent outbuildings or tank/other structures. The northwest corner of the Site is now indicated as a refuse tip.

1975. The Site is now noted as an engineering works. The main building still remains but the shape has altered slightly from the 1064 map, indicating minor extension & demolition works including removal of the former tanks central to the building structure with that area becoming part of the warehouse. A new area to the northeast corner is noted to comprise tanks, as well as a substation close to the northeast Site boundary. There is also a tank noted on the south boundary.

1992. Further extensions to the northwest corner.

2000. Historic satellite images show the further extentions to the northwest corner. They also show the tanks to the northeast corner, one comprising a large cylindrical steel tank, and smaller ones adjacent.

2005. No change.

2013. All Site buildings by now demolished, apart from the two old stone buildings to the front of the Site.

2018. Main stone mill building fronting Market Street is now demolished, leaving only the original building to the southest corner of the Site. Wormseye Phase 1 PRA undertaken.

2022. New & current Site owners.

1.4. Wormseye Geotechnical Phase 1 Report (2018).

The Wormseye Geotechnical assessment concluded the following conceptual model:

Source	Receptors	Pathway	Potential/Likely Pollutant Linkage
Asbestos	Construction workers/householders	Inhalation	Yes
	Off-site	Migration off-site	Yes
Inorganic contaminants	Construction workers	Short-term direct contact, inhalation of dust, ingestion	Yes
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	Yes
	Off-site	Migration off-site	Yes
	Groundwater	Leaching towards	Yes
	River/stream	Leaching towards	Yes
Sulphate	Building fabric	Concrete directly in contact with soil	Yes
Hydrocarbons	Construction workers	Short-term direct contact, inhalation of dust, ingestion	Yes
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	Yes
	Off-site	Migration off-site	Yes
	Service pipes	Seeping into drinking water pipes	Yes
	Groundwater	Migrating towards	Yes
	River/stream	Migrating/leaching towards	Yes
Hydrocarbon vapours	Construction workers	Short-term inhalation	Yes
	Householders	Inhalation of vapours indoors and outdoors	Yes
Landfill gas	End-users - in buildings	Seeping into buildings, explosion, asphyxiation	Yes
Radon	End-users - in buildings	Seeping into buildings	No

1.5. TJBA Site Reconnaissance – February 2023.

Details of Existing Structures:	The Site was accessed by an unmade lane to the Site from Albert Street. Almost all buildings on the Site had been demolished apart from the the stone warehouse to the southeast corner, and the substation to the northeast boundary adjacent the Albert Street access lane. Former concrete slabs were still in place to the much of the centre of the Site bridging the Spodden, and parts of the former mill building were to the east side adjacent the highway had been made into a temporary access direct from Market Street by locally regrading demolition fill in this area. Much of the east boundary of the Site with the Market Street highway is formed by retaining walls. Likewise the north Site boundary is formed by smaller nominally 2-3m high retaining walls. The base to the former steel tank was located, and comprised approximately a 3m diameter slab. The smaller tanks and other hardstandings in this area had been removed. The remaining ground surface comprised made ground which was partially vegetated especially around the perimeter. To the southwest corner of the Site was a vegatated and open area which still contained the former mill pond. The River Spodden flowed thorugh the west Site boundary, beneath a bridge linking Healey Dell Nature Reserve to Massey Croft (formerly the historic Whitworth branch railway line). The Spodden exited the Site through the south boundary to which was the former south wall of the original mill.

Adjacent Properties:	The Site is generally surrounded with residential terraces and associated garden areas to around the north & northwest perimeters, with Healey dell to the southwest & south. Market Street & associated retaining walls form the east boundary.
Water Levels, Directions of Flow and Rates in Rivers:	The River Spodden flows from the east through the Site, under the former building slabs, and out through the south of the Site back into an open water channel.
Areas of Discoloured Soil, Polluted Water, Vegetation, and Significant Odours:	All structures and surfaces except those noted above, had been demolished and removed back to the existing made ground.

1.6. Identification of Source-Pathway-Receptor.

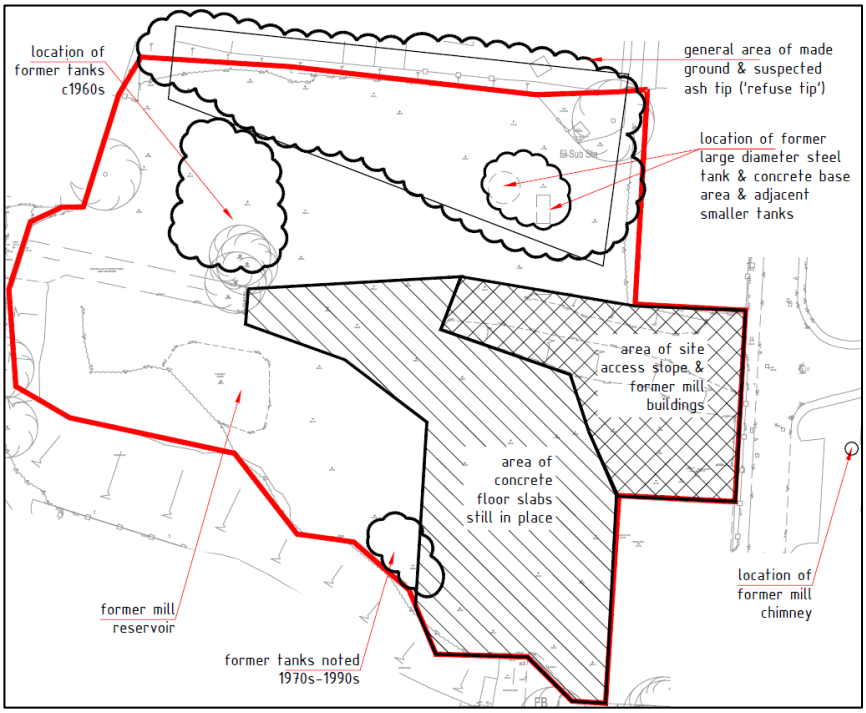
1.6.1. Summary & Discussion.

With regard to the previous demolition processes, many of the inert materials such as usable brick, stone, slate, steel & timbers etc had been recycled and removed from Site by the previous owner and their contractors. Specific sources of hazardous materials such as asbestos etc, are assumed to have been removed from Site prior to demolition. However, with no evidence of this, the Site will be tested accordingly.

Most of the former mill floor slabs which comprise reinforced concrete were left in place. The remainder of the Site comprised historic made ground from former phases of construction/demolition & groundworks.

The Wormseye PRA report considered specific potential contamination hotspots, however, some additional areas of concern have been noted. The chimney location was also incorrectly identified and was outside of the main Site across Market Street.

T J Booth Associates have undertaken a detailed history of the Site, and have undertaken an updated plan of potential hotspots, as noted below:



The discussion of the Wormseye/TJBA updated conceptual model sources are discussed below:

Chimney – The mill chimney was located outside of the main Site, opposite the mill front on Market Street. The land is considered mitigated with respect to environmental risk on the main Site. Records suggest it was demolished between the 1960s & 1970s.

Tanks – Tanks were noted on historic plans nominally to the centre northeast part of the Site adjacent the former mill buildings and were located on hardstandings. There was a main steel tank as well as some smaller ones in the same area. Other historic tanks were also noted on the 1960s OS plans to the west side of the mill (north bank of the Spodden), as well as some later tanks noted to the south boundary around the 1970s to 1990s.

Filled ground – Fill was noted to the north side of the Site from approximately c1910s to 1960s maps, in which is later referred to as a 'refuse tip'. Refuse tips on mill sites are commonly noted due to the amounts of ash/clinker produced over time, and thus most are found to comprise only ash fill which is generally inert, although they are a source of metals & PAH.

Pond – The former mill pond remains on Site and has not been infilled. Limited amount of risk from this area.

Made ground – There is a risk from existing general made ground and this should be assessed. Any contaminative material, (most likely PAH & metals from demolition material and ash), will now only be found as residual elements in the existing made ground. Most of the historic mill structures had been demolished in various phases of consrruction & demolition, including groundworks and level changes likely to contribute low level contamination to on-site made ground.

External landfill Sites - There is 1 historic landfill Site noted approximately 100m to the south. However the Wormseye Phase 1 PRA indicated the Site is not a relevant risk factor due to distance/severity & significance. The historic filled land is higher in elevation at the Site, is likely to comprise inert ash fill, and gas migration would be against the hydraulic gradient. Radon was also not considered a risk due to Landmark data noting the local area as a Class 1 area.

The Site is also underlain by alluvium.

Due to the above reasoning, the existing on-site historic made ground will have to be assessed in accordance with the risks identified, and with the associated contaminants of concern.

1.6.2. Potential Contaminants.

CURRENT SOURCE/S	ORIGINAL ASSOCIATED SOURCE	CONTAMINANT/S
Existing historic made ground – exists across the Site from multiple phases of historic demolition & construction.	Mill & demolition materials, mortars & plasters, cladding, heat resistant fixings/fittings/insulation, other material such as hardcore & planings etc.	Metals, PAHs, sulphates, asbestos.
	Infilled land (refuse tip) likely ash fill.	Metals, PAHs, (CH4, CO2 if any putrescible materials noted).
	Former tanks – most notably to the north of the current substation from old maps.	Hydrocarbons, BTEX, metals.
Site geology.	Existing Namurian formations.	Radon (Rn)
	Alluvium.	CH4, (only if peat noted).

1.6.3. Potential Pathways.

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

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

1.6.4. Potential Receptors.

Receptors mainly comprise workers in the construction phase, and workforce for the proposed end use.

Controlled waters: river, groundwater.

1.7. Preliminary Conceptual Model.

CURRENT SOURCE/S		ORIGINAL ASSOCIATED USAGE / LOCATION	CONTAMINANT TYPE	PATHWAY	RECEPTOR	POLLUTION LINKAGE	CONSEQUENCE	PROBABILITY	RISK
CHEMICAL (SOLID)	Existing made ground - surface/sub-soil.	Mill demolition & construction phases inc associated demolition materials, mortars & plasters, cladding, heat resistant fixings/fittings/insulation, other material such as hardcore & planings etc.	Metals, PAHs, sulphates, asbestos.	Direct ingestion, aerial ingestion, dermal contact, drinking water.	Site construction operatives & future occupants. Site buildings.	Multiple phases of historical demolition, and placement of historical made ground, as well as potential for degradation of asbestos cladding sheet etc while in situ externally, could now be in place in the upper made ground profile.	Medium.	High likelihood.	High risk.
		Former tanks – most notably to the north of the current substation from old maps.	Hydrocarbons, BTEX, metals.			There are 3 locations of former tanks on Site and storage of liquids could have historically spilled into the subsoil environment.	Medium.	High likelihood.	High risk.
		Refuse heap.	Metals, PAHs, sulphates, asbestos.			Much of the north side of the Site appears to have been infilled over time, likely with ash fill which poses a risk to receptors.	Medium.	High likelihood.	High risk.
GROUND GAS RISK (VAPOURS)	Geological ground gas.	Radon sources in Namurian deposits.	Rn.	Diffusion through soil, substructures, aerial inhalation.	Future occupants. Explosion, suffocation.	The Site is within a Class 1 radon area. No protective measures are required.	Medium.	Unlikely.	Low risk.
		Alluvium.	CH4, CO2.			Dependent on peat or clay cover above.	Medium.	Unlikely.	Low risk.
	Anthropogenic ground gas sources.	Made gound including the 'refuse tip' infilled area to the north side of the Site.	CH4, CO2, other trace gases.			The pollutant linkage will only be viable if there is putrescible material in the ground.	Medium.	Unlikely.	Low risk.
		Former mill ponds.				Mill pond had not been infilled.	Mild.	Unlikely.	Very low risk.
CHEMICAL (LIQUID)	Existing made ground - surface/sub-soil.	Former tanks.	Hydrocarbons, BTEX, metals, PAH.	Permeation through soil into ground water, local watercourses, or aquatic habitats.	Contaminated ground / surface water. Controlled Waters such as watercourses, canal, aquatic habitats & associated wildlife.	There is a risk that spills could have occurred from historic tanks, and the type of contaminants stored are generally mobile in the ground & aquatic environment.	Medium.	Likely.	Moderate risk.
		Mill demolition materials, mortars & plasters, other material such as hardcore & planings etc.	Metals, PAHs.			Unlikely to pose a significant. Metal & PAH contamination is expected to be minor, and these contaminants of concern are not as mobile as others.	Mild.	Low likelihood.	Low risk.

1.8. Site Investigations.

1.8.1. Site Investigations (Trial Holes) 17.04.2023.

Site Investigations were undertaken by T J Booth Associates and comprised 7No. machine excavated trial holes (THs 1-7), undertaken with a 13t back acting excavator.

Trial holes were located around the Site to gain an understanding of the geology for future geotechnical design, but particularly located around specific features noted in historic data searches such as former tanks, mill ponds, and refuse heaps.

Regarding these features in particular, trial holes were situated as follows:

- TH1 was located in the location of the former 1970s-1990s tanks to the south boundary and beneath former floor slabs. The trial hole revealed a relatively thin made ground (800mm) of clayey demolition fill over alluvial gravelly clay, and boulder clays. There was no visual or olfactory evidence of hydrocarbon contamination.
- THs2 & 3 were undertaken in general areas adjacent & beneath some of the former mill buildings (TH2) & around the former mill pond (TH3). The trial holes revaled between 900-2000mm silty sand & gravel made ground which appeared to be moved/replaced alluvial material possibly placed in situ due to historic groundworks associated with the pond. Virgin alluvial sand & gravels were noted below to bottom of hole. Groundwater noted at 1800mm (TH2) and 3000mm (TH3).
- TH4 & 5 situated around the former 1960s tanks to the west side of the former mill buildings. The trial hole revealed between a 1800-2200mm made ground of clayey demolition fill with abundant cobble & boulders of brick, stone, slate with rare glass, pottery, plastic etc. A slight organic/hydrocarbon odour was noted in these THs. The made ground was underlain by virgin boulder clays with groundwater perched on top of the clay in both THs at respective depth (1800-2200mm).
- THs6, & 7 were located around the north boundary to target the 'refuse tip' and infill in this area, and TH7 also positioned local to the former tanks to the northeast of the Site. In both trial holes ash fill was found to 1900mm depth in TH6 & to 3000mm in TH7 (due to GL changes). In both holes firm boulder clay was noted beneath the ash fill. There was no visual or olfactory evidence of hydrocarbon contamination in either of the trial holes. Abundant groundwater was noted which quickly inundated the holes due to the porous nature of the ash fill and was noted at approximately 1500 to 2500mm depth bGL again perched on top of the clay.

8No. soil samples (S1-8) were also taken in the made ground horizons to assess the potential ground contamination both in specific location identified above, and also to get general background contamination levels across the Site.

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

Samples were tested for metals, speciated PAH, inorganics & sulphates, SOM, & asbestos screening in accordance with the conceptual model. Further hydrocarbon TPH(CWG) & BTEX testing was undertaken in THs4 & TH5 where hydrocarbon odours were noted in the position of the former tanks to the west side of the Site.

1.8.2. Site Investigations (Trial Holes) 20.07.2023.

Site Investigations were undertaken by T J Booth Associates and comprised a further 2No. machine excavated trial holes (THs 8-9), undertaken with a 13t back acting excavator.

The investigation was undertaken to gain an initial understanding of the effects on groundwater chemistry & also to understand what effects this may have on the adjoining watercourse & to assess for potential changes in water chemistry upstream and downstream of the River Spodden. The trial holes were as follows:

- TH8 was positioned in the location of THs4 & 5 to the north side of the River Spodden (the location of hydrocarbon odours in the earlier investigation). The trial hole revealed 1500mm of made ground comprising a clayey sand & gravel demolition fill with abundant cobble & boulders of brick, stone, slate with occasional plastic etc. The made ground was underlain by virgin clays with groundwater noted at 2400mm depth.
- TH9 was located to the south bank located between the old mill pond and the former mill buildings. The trial hole revealed a relatively thin made ground (400mm) of clayey demolition fill over alluvial gravelly clay over alluvial clays. Groundwater was noted at approx 2600mm depth.

Two groundwater samples (GWS1 & 2), as well as 3No. surface water samples (WS1-3) were taken for analysis and to assess the potential for contamination of controlled waters. WS1 was taken immediately to the south side of the mill (downstream), WS2 taken nominally central to the Site, and WS3 approximately 20m upstream of the Site boundary to ascertain general

contaminants within the river prior to encountering the Site boundary.

Water samples were sealed in 1l glass bottles, vials plastics 100/500mm plastic bottles, and were sent to Envirolab Ltd to be tested for a range of common contaminants.

Samples were tested for metals, speciated PAH, inorganics, hydrocarbon TPH(CWG) & BTEX.

1.9. Risk Assessments.

1.9.1. Human Health Risk.

On return the samples were assessed by TJ Booth Associates to common threshold comparison data, specifically the Defra Category 4 Screening Levels (C4SLs), then to LQM/CIEH (S4ULs).

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

Trial Hole/Soil Sample	Made ground horizon	Mitigation/Action
TH1/S1	asbestos identified & quantified (<0.001%)	PASS
TH2/S2	n/a	PASS
TH3/S3	benzo[b]fluoranthene, dibenz[ah]anthracene	FURTHER ACTION
TH4/S4	chromium III, lead, asbestos (<0.03%)	FURTHER ACTION
TH5/S5	Lead, asbestos (<0.03%), benzo[a]pyrene, benzo[b]fluoranthene, dibenz[ah]anthracene	FURTHER ACTION
TH6/S6	n/a	PASS
TH7/S7	arsenic, nickel, sulphates	FURTHER ACTION
Stockpile S8	nickel, asbestos (<0.001%), benzo[a]pyrene, benzo[b]fluoranthene, dibenz[ah]anthracene	FURTHER ACTION

Due to above elevated levels noted, existing Site soil is considered contamnated above threshold levels allowed for a residential end use.

Minor hydrocarbon contamination was noted in THs4&5 as suspected, but levels were below residential thresholds.

The existing soils will not be suitable for reuse with regard to human receptos and a suitable cover system will need to be employed.

The existing soil will be partially mitigated due to the proposal to raise levels.

1.9.2. Controlled Waters Risk.

On return the samples were assessed by TJ Booth Associates to common threshold comparison data. Surface water/river sampling results are generally compared against the Environment Quality Standards for Freshwater (EQS), and groundwater samples against the EQS & also drinking water standards (UK DWI 2016 & WHO 2022).

Testing of groundwater samples was undertaken to assess the potential for groundwater contamination, and specifically around trial holes 4&5 where the earlier hydrocarbon odour was noted (although soil testing suggested the risk was low from a human health perspective). The following results are only for samples that require further discussion & mitigation. All contaminants of concern that passed the chemical analysis have been omitted):

Contaminant (individual or group)	EQS (AA or MAX)	UK DWI	WHO	GWS1	GWS2	Mitigation/Action
Chromium VI	3.4	50	50	LOD <10	LOD <10	FURTHER DISCUSSION
Copper	1	2000	2000	LOD <4	LOD <4	FURTHER DISCUSSION
Mercury	0.07	1	6	LOD <0.1	LOD <0.1	FURTHER DISCUSSION
Benzo[a]pyrene	0.27	0.01	0.7	0.1	LOD <0.02	FURTHER DISCUSSION

Benzo[b]fluoranthene	0.017	0.1	n/a	0.11	LOD <0.02	FURTHER DISCUSSION
Benzo[ghi]perylene	0.0082	0.1	n/a	0.07	LOD <0.02	FURTHER DISCUSSION
Benzo[k]fluoranthene	0.017	0.1	n/a	0.05	LOD <0.02	FURTHER DISCUSSION
Indeno[123cd]pyrene	0.00017	0.1	n/a	0.07	LOD <0.02	FURTHER DISCUSSION
Phenol	46	n/a	n/a	LOD <100	LOD <100	FURTHER DISCUSSION

The primary risk factor for groundwater is to underlying aquifers and the River Spodden. The Site is underlain primarily by a thick layer of alluvial clay to the north & east part of the Site, which offers protection to the underlying Secondary A aquifers.

The results for GWS1 were below the laboratory LOD for all contaminants except for some PAHs. Only benzo[a]pyrene & benzo[b]fluoranthene were elevated above DWI drinking water standards, and passed the WHO guidelines, although results were marginal. The superficial aquifer on this side of the Site is considered less of a risk as the Site is covered with a thick c1m layer of clay offering additional protection from groundwater which is perched beneath made ground. The groundwater will therefore be more of a risk to the watercourse where determinands were noted slightly above the EQS values.

Groundwater sample GWS2 returned determinand results below the laboratory LOD for all contaminants of concern. Although some of these were above the relevant EQS & DWI regulations, they were marginal elevations and all were below drinking water standards.

Both GWS1 & GWS2 are therefore considered to be of no risk to aquifers.

Testing of surface water (River Spodden) samples revaled the following results for samples that require further discussion & mitigation. All contaminants of concern that passed the chemical analysis have been omitted):

Contaminant (individual or group)	EQS (AA or MAX)	UK DWI	WHO	GWS3 (upstream)	GWS2 (mid point)	GWS1 (downstream)	Mitigation/Action
Chromium VI	3.4	50	50	LOD <10	LOD <10	LOD <10	FURTHER DISCUSSION
Copper	1	2000	2000	LOD <4	LOD <4	LOD <4	FURTHER DISCUSSION
Mercury	0.07	1	6	LOD <0.1	LOD <0.1	LOD <0.1	FURTHER DISCUSSION
Benzo[a]pyrene	0.27	0.01	0.7	LOD <0.02	LOD <0.02	LOD <0.02	FURTHER DISCUSSION
Benzo[b]fluoranthene	0.017	0.1	n/a	LOD <0.02	LOD <0.02	LOD <0.02	FURTHER DISCUSSION
Benzo[ghi]perylene	0.0082	0.1	n/a	LOD <0.02	LOD <0.02	LOD <0.02	FURTHER DISCUSSION
Benzo[k]fluoranthene	0.017	0.1	n/a	LOD <0.02	LOD <0.02	LOD <0.02	FURTHER DISCUSSION
Indeno[123cd]pyrene	0.00017	0.1	n/a	LOD <0.02	LOD <0.02	LOD <0.02	FURTHER DISCUSSION

When each of the water samples (WS1-3) were compared together the following trends were identified.

- All samples were almost identical, with all determinands generally below the laboratory LOD.
- Metals were generally lower than EQS thresholds, however in the three contaminants which were above (chromium VI, copper & mercury; all were below the LOD and showed no discernible change from upstream to downstream.
- PAHs were recorded at the LOD & showed no discernible change from upstream to downstream.
- All CWG & BTEX hydrocarbons were noted below the LOD.

Due to no discernible difference from river sampling upstream of the Site to downstream, the risk to controlled waters from the Site is considered to be low.

1.9.3. Ground Gas Risk.

1.9.3.1. Historic landfill Sites.

The closest historic landfill is approximately 100m to the south. It is not considered to be a major source of ground gas generation, but regardless, there are significant issues around pathways as follows:

- The landfill is hydraulically isolated from the Site by watercourses including the River Spodden and its tributaries. It is also downstream against the hydraulic gradient.
- The natural geology of the Site and local area comprises a c 1m cover of alluvial clay. Outside of the alluvial areas,

boulder clay dominates the local area. The historic fill overlies these deposits.

- The infilled land is also isolated from the Site topographically, being on the oposite side of the Spodden & its tributary Ranger Sike.

1.9.3.2. On-site Refuse Tip.

The 'refuse tip' area to the north of the Site was investigated and found to comprise ash and clinker which made up nominally 100% of the made ground deposit, overlying the alluvial clay.

Ash and clinker is known to comprise little degradable organic carbon, and thus is not considered a legitimate source of ground gas. No other putrescible materials were noted in the fill.

No credible risk is attributed to this source.

1.9.3.3. Radon.

Although the Site is within an area underlain by Namurian bedrock, the Landmark report indicated the the Site is within a Class 1 radon protection area, and as such, radon protectiive measures is not required in new development.

1.9.3.4. Alluvium.

Site investigations noted alluvial deposits below the Site which generally comprised a c1m continuous layer of soft to firm clay over alluvial silty sand& gravels. No peat was noted in any of the trial holes. BS8485 indicates that for alluvial deposits to pose a risk, a 'pathway only exists if soil above is sufficiently permeable to allow gas to migrate to the surface'.

The assessment concludes that the underlying alluvial deposits are not a credible source of gas forming material, and the pathways to the surface are inhibited by the continuous overlying clay.

1.10. Environmental Site Risk Summary/Conclusions.

Following on from Site investigations and sampling, the made ground profile & superficial deposits have been identified. Generally, the Site is covered with between 1-2m of historic made ground with this inceasing to 3m depth only at the far northeast corner of the Site. To the north and east of the River Spodden, the Site is underlain generally by historic fill

North & east of the River Spodden - made ground is generally comprised of sand & gravel fill in a clayey/silty matrix, which is generally demolition material with coarse brick/stone inclusions, and to a lesser extent, glass, slate, ash & concrete. Closer to the north boundary the Site was also historically infilled with sand and gravel ash/clinker fill, which was tipped between c1910 & c1960s. Beneath the fill is clay which is continuous beneath the Site.

South of the River Spodden – Made ground was noted as above (historic demolition fill in a clayey/silty matrix), but was generally thinner at around 1m. Beneath this area, superficial deposits comprised alluvial sand & gravels.

General made ground across the Site has proven to be mildly contaminated with metals, PAHs, and asbestos which could be a risk to human health only.

Specific areas had been identified for investigation, in particular areas that historically contained tanks, but no hydrocarbon contamination has been noted across the Site. There is an area to the west side of the Site and to the north bank of the Spodden which has shown some slightly elevated PAHs, but these have been shown to have no risk to controlled waters such as the below aquifers, or the River Spodden.

There are no coal seams beneath the Site, and the local area is within a class 1 radon protection area. No protective measures are required due to coal seams or radon.

There is a local historic landfill site, but this is to the south against the hydraulic gradient, is on the other side of the valley, and is at higher level – so little risk of ground gas is attributed to these sources & any pathways are considered mitigated.

Regarding potential ground gas risk areas within the Site:

- The refuse tip to the north & northwest was investigated and comprises layers of sand & gravel ash/clinker fill with no putrescible material noted.
- The former reservoir to the southwest side of the Site remains and hasn't been infilled.

Considering the above, the main residual risks are:

Human health - general contamination across the Site above threshold levels for residential end uses.

1.11. Final Conceptual Model.

CURRENT SOURCE/S		ORIGINAL ASSOCIATED USAGE / LOCATION	CONTAMINANT TYPE	PATHWAY	RECEPTOR	POLLUTION LINKAGE	CONSEQUENCE	PROBABILITY	RISK
CHEMICAL (SOLID)	Existing made ground - surface/sub-soil.	Mill demolition & construction phases inc associated demolition materials, mortars & plasters, cladding, heat resistant fixings/fittings/insulation, other material such as hardcore & planings etc.	Metals, PAHs, sulphates, asbestos.	Direct ingestion, aerial ingestion, dermal contact, drinking water.	Site construction operatives & future occupants. Site buildings.	Metals, PAH and asbestos have been recorded associated with the made ground profile.	Medium.	High likelihood.	High risk.
		Former tanks – most notably to the north of the current substation from old maps.	Hydrocarbons, BTEX, metals.			No hydrocarbon contamination was noted above residential threshold levels.	Medium.	Unlikely.	Low risk.
		Refuse heap.	Metals, PAHs, sulphates, asbestos.			Metals have been recorded associated with the made ground profile.	Medium.	High likelihood.	High risk.
GROUND GAS RISK (VAPOURS)	Geological ground gas.	Radon sources in Namurian deposits.	Rn.	Diffusion through soil, substructures, aerial inhalation.	Future occupants. Explosion, suffocation.	The Site is within a Class 1 radon area. No protective measures are required.	Medium.	Unlikely.	Low risk.
		Alluvium.	CH4, CO2.			No peat, clay cover above.	Medium.	Unlikely.	Low risk.
	Anthropogenic ground gas sources.	Made gound including the 'refuse tip' infilled area to the north side of the Site.	CH4, CO2, other trace gases.			No putrescible material was found in the made ground profile.	Medium.	Unlikely.	Low risk.
		Former mill ponds.				Mill pond had not been infilled.	Mild.	Unlikely.	Very low risk.
CHEMICAL (LIQUID)	Existing made ground - surface/sub-soil.	Former tanks.	PAHs.	No realistic pathway. Site is underlain by clay.	Contaminated ground / surface water. Controlled Waters such as watercourses, canal, aquatic habitats & associated wildlife.	No hydrocarbon contamination was noted above water guideline levels. Only minor elevations of PAH noted, and the Site is underlain by clay which offers protecction.	Mild.	Unlikely.	Very low risk.
		Mill demolition materials, mortars & plasters, other material such as hardcore & planings etc.	PAHs.						

2. PHASE 3 – REMEDIATION STATEMENT

2.1. Basic Site Details

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

2.2. Site & Remedial Objectives

Site investigations undertaken as part of the Phase 2, comprised trial holes, soil & water sampling methods.

Historic made ground has been recorded over the Site to a max depth generally to 2m deep but 3m to the far northeast corner.

There is currently one remedial objective for the Site:

- General soil remediation.

Soils should be free from elevated contaminants above residential threshold levels to ensure the safety of the end user.

Needs to be undertaken to ensure human receptors are not negatively impacted.

There was no ground gas risk noted to the development.

There was no risk noted to controlled waters.

2.3. Conceptual Model (Final) & Relevant Pollution Linkages

Refer to Phase 2 Site Investigation and Assessment section of the report for Final Conceptual Model.

A pollutant linkage was identified regarding the minor contamination of Site made ground with metals, PAH & asbestos noted.

To break the pollution linkage, either the source must be removed, a cover layer introduced, or the pathways mitigated. It is not appropriate in this case to modify behaviour of or remove receptors.

2.4. Recommended Remediation:

General Made ground:

Much of the Site is to be filled (under appropriate licences from the Environment Agency), by approximately 2-3m with clean/inert fill. In these areas no further mitigation will be required as an adequate cover layer will have been imported to protect human receptors from any minor contamination.

However, there will be areas where made ground will be less than 600mm from finish levels.

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

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

Root systems for shrubs are typically up to 600 mm;

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

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

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

The cover level can be further reduced to 450mm in common or public open space areas.

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

2.5. Verification (Phase 4 requirements)

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

- Import source material.
- Characterisation & suitability of material.
- Soil sampling should be undertaken as per YALPAG Guidelines as per the following ratios:

Virgin quarried materials, 1-2 samples to confirm inert nature.

Crushed hardcore, stone, brick, min 1 sample per 500cum.

Greenfield/manufactured, generally 1 sample per 250cum (min 3 samples).

Brownfield, generally 1 sample per 50cum (min 6 samples).

Samples should be tested for the following contamination suites: metals, inorganics, PAH USEPA16 speciated, and asbestos screening. Results will be analysed against Defra Category 4 Screening Levels (C4SLs) where available, and then to the LQM/CIEH (S4ULs), for use in a residential end use setting.

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

2.6. Additional Notes

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

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

Signed……  .

D.S.Slattery BSc (Hons).

T J Booth Associates.

Authorised…  .

T J Booth BSc (Hons), C. Eng. C. Env. MICE.

T J Booth Associates.

3. REFERENCES.

BS 8485:2015+A1:2019. Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.

BS 10175:2011+A2:2017. Investigation of potentially contaminated sites. Code of practice.

BS5930:2015. Code of practice for site investigations.

CL:AIRE. 2012. Research Bulletin-RB17-A Pragmatic Approach to Ground Gas Risk Assessment.

CIRIA. Report C665.

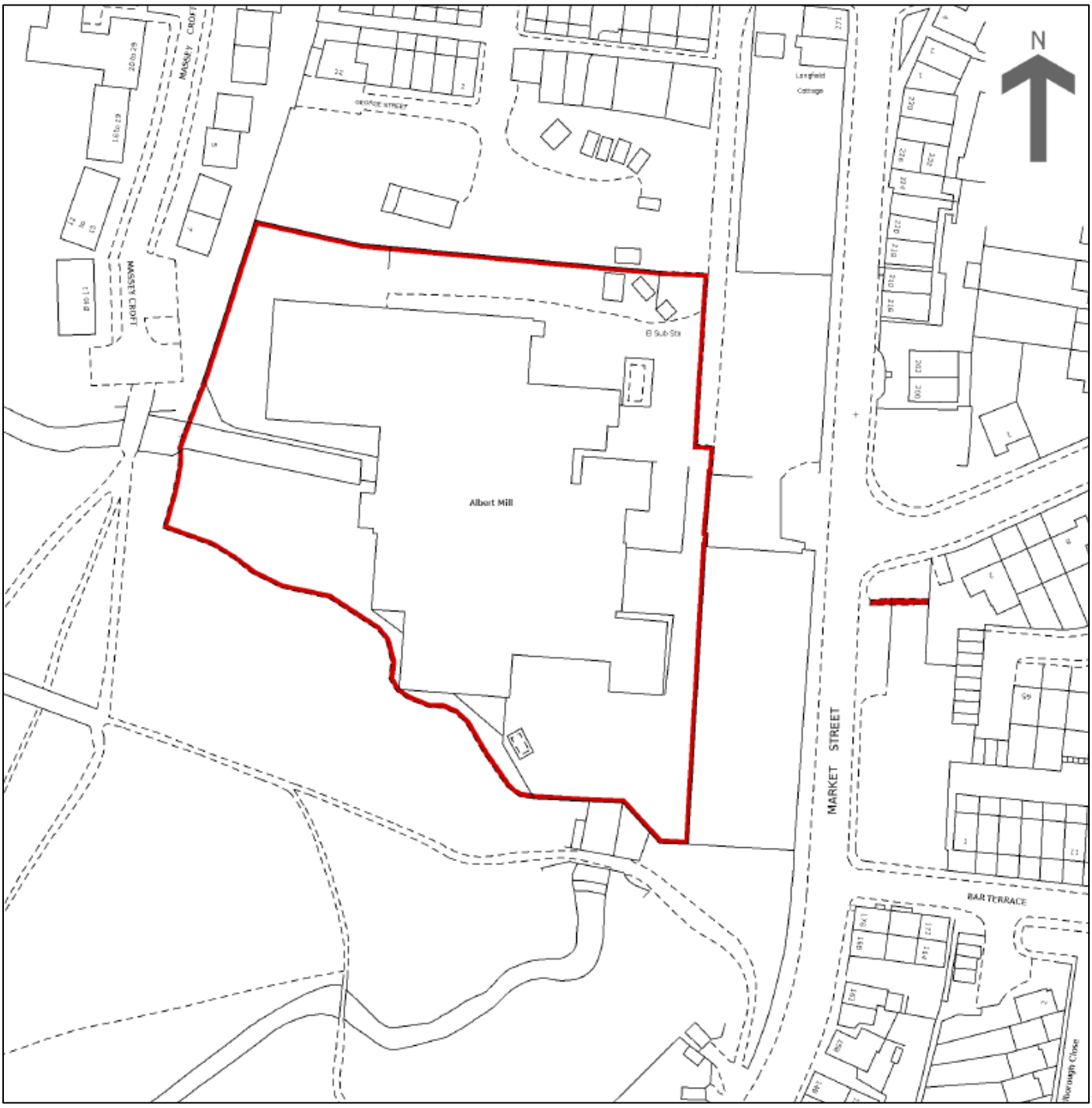
Environment Agency. 2005. Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination. R&D Technical Report P5-066/TR.

ICE Manual of Geotechnical Engineering Volume I. 2012.

CIRIA. Report SP32.

4. APPENDIX A: PLANS, FIGURES, ASSESSMENTS & CERTIFICATION.

4.1. Location Plan.



4.2. Proposed Development.

4.3. Site Investigation Plan.

SITE INVESTIGATION NOTES:

THs1-7	*trial holes*	*TJBA*	*17.04.2023*
S1-8	*soil samples*	*TJBA*	*17.04.2023*
THs8-9	*trial holes*	*TJBA*	*20.07.2023*
WS1-3	*water samples (river)*	*TJBA*	*20.07.2023*
GWS1-2	*water samples (ground)*	*TJBA*	*20.07.2023*

AMENDMENTS/ ISSUES			

T J BOOTH ASSOCIATES
CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

20A Eastgate Street
Rochdale
Lancashire
OL16 1DH
Tel: 01706 868288

JA YATES / ALBERT MILL, WHITWORTH

4.4. Trial Hole Logs.

Trial pit reference TH1				Sheet 1 of 1
Water	Reduced Level (m)	Legend	Depth (m)	Description
	207.95			
	207.15	X X / X X / X X / X X	(0.80) 0.80	Brown/grey clayey sand & gravel MADE GROUND. Sand & gravel is red brick, stone, glass, slate & occasional ash, plastic, fabric & rebar (S1).
v	205.85 205.85	- - -	(1.30) 2.10	Firm light brown gravelly CLAY
	204.55	- - -	(1.30) 3.40	Soft becoming soft to firm blue-grey CLAY (becoming firm at 3200)
				Trial pit ends
Not shown to scale				
Additional notes:				

Trial pit reference TH2				Sheet 1 of 1
Water	Reduced Level (m)	Legend	Depth (m)	Description
	207.95			
	205.75	X X / X X / X X / X X / X X / X X / X X / X X / X X / X X / X X	(2.20) 2.20	Light brown-grey occasionally clayey sand & gravel MADE GROUND. Abundant sandstone cobbles & boulders, with occasional brick, rebar & plastics (S2).
v	204.95 204.55	: o : o : / o : o : o	(1.20) 3.40	Medium dense to dense light brown silty SAND AND GRAVEL
				Trial pit ends
Not shown to scale				
Additional notes:				

T J BOOTH ASSOCIATES

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

Trial pit reference TH3 Sheet 1 of 1

Water	Reduced Level (m)	Legend	Depth (m)	Description
	207.75			
	206.85	X X X X X X X X X X	(0.90) 0.90	Brown silty sand & gravel MADE GROUND (S3). Occasional gravel sized brick and boulder sized stone.
	206.25	X - X - - X - X - X - X -	(0.60) 1.50	Soft light brown-grey clayey MADE GROUND
v	205.95 205.85	: o : o : o : o : o	(0.40) 1.90	Medium dense to dense light brown silty SAND AND GRAVEL
				Trial pit ends

Not shown to scale

Additional notes:

Trial pit reference TH4 Sheet 1 of 1

Water	Reduced Level (m)	Legend	Depth (m)	Description
	208.85			
v	207.05 207.05	X X X X X X X X X X X X X X	(1.80) 1.80	Dark grey clayey sand & gravel MADE GROUND (S4). Gravel is brick, stone, glass, slate, pottery & occasional plastics. Abundant cobbles & boulders of sandstone & brick. Slight organic/potential hydrocarbon odour.
	206.15	- : - : - : : - : - : - - : - : - : : - : - : -	(0.90) 2.70	Soft grey-blue slightly sandy CLAY
	205.65	: o : o : o : o : o : o : o : o :	(0.50) 3.20	Medium dense to dense light brown silty SAND AND GRAVEL
				Trial pit ends

Not shown to scale

Additional notes:

T J BOOTH ASSOCIATES

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

Trial pit reference TH5 Sheet 1 of 1

Water	Reduced Level (m)	Legend	Depth (m)	Description
	209.25			
		X X X X X X X X X X X X X X X X X X X X	(2.20)	Dark grey clayey sand & gravel MADE GROUND (S5). Gravel is brick, stone, glass, slate, pottery & occasional plastics. Abundant cobbles & boulders of sandstone & brick. Slight organic/hydrocarbon odour.
v	207.50			
	207.05		2.20	
		- : - : - : : - : - : - - : - : - : : - : - : -	(0.70)	Soft grey-blue slightly sandy CLAY
	206.35		2.90	
		: o : o : o : o : o	(0.30)	Medium dense to dense light brown silty SAND AND GRAVEL
	206.05		3.20	
				Trial pit ends

Not shown to scale

Additional notes:

Trial pit reference TH6 Sheet 1 of 1

Water	Reduced Level (m)	Legend	Depth (m)	Description
	209.10			
		X X X X X X X X X X X X X X X X X X X X	(1.90)	Dark grey/red sandy, gravelly ashy MADE GROUND (S6).
v	207.60			
	207.20		1.90	
		- : - : - : : - : - : - - : - : - : : - : - : -	(0.70)	Firm grey-blue slightly sandy CLAY
	206.50		2.60	
	206.30	: o : o :	2.80	Medium dense to dense light brown clayey SAND AND GRAVEL
				Trial pit ends

Not shown to scale

Additional notes:

T J BOOTH ASSOCIATES

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

Trial pit reference TH7 Sheet 1 of 1

Water	Reduced Level (m)	Legend	Depth (m)	Description
	211.18			
		X X X X X X X X X X X X X X X X X X X X	(3.00)	Dark grey/red sandy, gravelly ashy MADE GROUND (S7).
v	208.18	X X	3.00	
	207.68	- o - o - o - o - o - o - o -	(0.50) 3.50	Firm grey-blue slightly gravelly CLAY
	207.48	: o : o :	3.70	Medium dense to dense light brown clayey SAND AND GRAVEL
				Trial pit ends

Not shown to scale

Additional notes:

Trial pit reference TH8 Sheet 1 of 1

Water	Reduced Level (m)	Legend	Depth (m)	Description
	208.20			
		X X X X X X X X X X X X	(1.30)	Dark grey clayey sand & gravel MADE GROUND. Abundant cobbles & boulders of sandstone & brick. Gravel is brick, stone, slate, glass, occasional plastic & pottery.
v	206.90			
	206.90	X X	1.30	
		- - - - - - - - -	(0.60)	Soft grey-blue CLAY
	206.30		1.90	
		: o : o : o : o : o : o : o : o : o : o	(0.80)	Light brown silty SAND AND GRAVEL (GWS1).
	205.50		2.70	
				Trial pit ends

Not shown to scale

Additional notes: GWS1 at 2400 depth.

T J BOOTH ASSOCIATES

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

Trial pit reference TH9 Sheet 1 of 1

Water	Reduced Level (m)	Legend	Depth (m)	Description
	207.95			
	207.55	X X X X	(0.40) 0.40	Dark grey sand & gravel MADE GROUND. Sand & gravel is brick, stone & rare plastic.
v	206.25	- - - - - - - - - - - -	(1.30)	Light brown very sandy, very gravelly CLAY
	206.25	- - -	1.70	
	205.45	- - - - - - - - -	(0.80) 2.50	Firm grey-blue CLAY
	205.25	: o : o :	2.70	Medium dense to dense light brown SAND AND GRAVEL (GWS2).
				Trial pit ends

Not shown to scale

Additional notes: GWS2 at 2600 depth

4.5. Soil & Water Sampling Analysis.

Client / Site:	***Y A Yates - Albert Mill, Whitworth***						
Sample Type:	***Soil Samples***						
Sampling Date:	***17.04.2023***						
Contaminant		**No**	**Max**	**Mean**	**t 95**	**RESIDENTIAL (with or without plant uptake)**	
						Pass/Fail	**Comment**
METALS	Arsenic as As, dry weight	7	210	48.28571	156.6	37	FAIL	S7
	Boron as B, hot water sol dw	8	4.8	1.6625	3.995	290	PASS	
	Cadmium as Cd, dry weight	8	3.1	1.3125	2.435	22	PASS	
	chromium as Cr(III) dry weight	8	1250	289.38	1028.45	910	FAIL	S4
	Chromium as Cr(VI), dry weight	8	1	1	1	21	PASS	
	Copper, as Dry Weight	8	708	287.875	705.9	2400	PASS	
	Lead, as Dry Weight	8	805	259.375	648.55	200	FAIL	S4, S5
	Mercury as Hg, dry weight	8	1.1	0.33	0.855	1.2	PASS	
	Nickel as Ni, dry weight	8	156	62.25	154.95	130	FAIL	S7, S8
	Selenium as Se, dry weight	8	3	1.5	3	250	PASS	
	Zinc as Zn, dry weight	8	363	166.25	321.35	3700	PASS	
INORGANIC	Cyanide (Total)	8	1	1	1	2.5	PASS	
	Sulphate (Total) as SO4	8	0.39	0.1435	0.3235	0.24	FAIL	S7: DS2-AC2
	Sulphide	8	33	11.125	28.8	250	PASS	
	pH	8	8.49	7.7975	8.3535	6 to 8	ALKALINE	
	Sulphur (Elemental)	8	62	21.5	51.85	100	PASS	
	Asbestos Identification	8	1	0.5	1	0	FAIL	S1, S4, S5, S8
	Asbestos quantification	4	0.027	0.01275	0.02625	0.001	FAIL	S4 & S5 <0.03
ORGANIC	SOM	8	6	5.5625	6			
PAH	acenaphthene	8	3.27	0.68875	2.4895	1100	PASS	
PAH	acenaphthylene	8	0.1	0.0325	0.0895	920	PASS	
PAH	anthracene	8	4	0.88375	3.041	11000	PASS	
PAH	benzo[a]anthracene	8	10	2.73125	8.5825	13	PASS	
PAH	benzo[a]pyrene	8	12.4	3.49875	11.259	5	FAIL	S5, S8
PAH	benzo[b]fluoranthene	8	15.2	4.42	13.765	3.7	FAIL	S3, S5, S8
PAH	benzo[g,h,i]perylene	8	5.93	1.93375	5.86	350	PASS	
PAH	benzo[k]fluoranthene	8	6.9	2.0325	6.1335	100	PASS	
PAH	chrysene	8	8.64	2.4475	7.492	27	PASS	
PAH	dibenz[ah]anthracene	8	0.93	0.315	0.881	0.3	FAIL	S3, S5, S8
PAH	fluoranthene	8	25.8	6.6075	21.6	890	PASS	
PAH	fluorene	8	1.97	0.40125	1.473	860	PASS	
PAH	indeno[123-cd]pyrene	8	5.69	1.82125	5.4905	41	PASS	
PAH	napthalene	8	3.09	0.52375	2.1275	13	PASS	
PAH	phenanthrene	8	17	3.92125	13.0975	440	PASS	
PAH	pyrene	8	22.2	5.61	18.49	2000	PASS	
PAH	PAH (Total - SUM EPA16)	8	143	37.83875	121.79	1	comment	
FUEL	aliphatic EC 8-10	3	10	5	9.3	150	PASS	
FUEL	aliphatic EC 10-12	3	10	5.666667	9.4	760	PASS	
FUEL	aliphatic EC 12-16	3	10	6.333333	9.5	4300	PASS	
FUEL	aliphatic EC 16-35	3	678	484.6667	662.8	110000	PASS	
FUEL	aromatic EC 8-10	3	10	6	9.4	190	PASS	
FUEL	aromatic EC 10-12	3	10	6	9.4	380	PASS	
FUEL	aromatic EC 12-16	3	44	23	41.3	660	PASS	
FUEL	aromatic EC 16-21	3	172	94	162.4	930	PASS	
FUEL	aromatic EC 21-35	3	596	262.6667	548.8	1700	PASS	
VOC/BTEX	benzene	3	0.01	0.01	0.01	0.87	PASS	
VOC/BTEX	toluene	3	0.01	0.01	0.01	660	PASS	
VOC/BTEX	ethylbenzene	3	0.01	0.01	0.01	260	PASS	
VOC/BTEX	m-xylene	3	0.01	0.01	0.01	320	PASS	
VOC/BTEX	p-xylene	3	0.01	0.01	0.01	310	PASS	
VOC/BTEX	o-xylene	3	0.01	0.01	0.01	330	PASS	
SVOC	phenol	8	0.5	0.2375	0.395	380	PASS	

T J BOOTH ASSOCIATES

CONSULTING CIVIL & GEOTECHNICAL ENGINEERS

Client / Site:	***Y A Yates - Albert Mill, Whitworth***
Sample Type:	***Water Samples***
Sampling Date:	***20.07.2023***

CONTAMINANT		No	Max	Mean	t 95	EQS FRESHWATER			UK DWI WATER SUPPLY REGULATIONS 2016			WHO DRINKING WATER QUALITY 2017		
							Pass/Fail	Comment		Pass/Fail	Comment		Pass/Fail	Comment
METALS	Arsenic	5	1	1	1	50	PASS		10	PASS		10	PASS	
	Cadmium	5	0.2	0.2	0.2	1.5	PASS		5	PASS		3	PASS	
	Chromium III	5	7	4.40	7.00	32	PASS		50	PASS		50	PASS	
	Chromium VI	5	10	10	10	3.4	FURTHER ACTION	all below LOD	50	PASS		50	PASS	
	Copper	5	4	4	4	1	FURTHER ACTION	all below LOD	2000	PASS		2000	PASS	
	Lead	5	1	1	1	14	PASS		10	PASS		10	PASS	
	Mercury	5	0.1	0.1	0.1	0.07	FURTHER ACTION	all below LOD	1	PASS		6	PASS	
	Nickel	5	2	2	2	34	PASS		20	PASS		70	PASS	
	Selenium	5	1	1	1	0	NO REGS		10	PASS		40	PASS	
	Zinc	5	3	2.2	2.8	10.9	PASS		0	NO REGS		3000	PASS	
INORGANIC	Cyanide (Total)	5	5	5	5	5	PASS	below LOD	50	PASS		0	NO REGS	
	Sulphate	5	1E+05	52800	129600	400000	PASS		250000	PASS		0	NO REGS	
	pH	5	7.62	7.168	7.522	0	NO REGS	below LOD	6.5-9.5	PASS		0	NO REGS	
ORGANIC	TOC	5	4.1	3.32	4									
PAH	anthracene	5	0.02	0.02	0.02	0.1	PASS		0	NO REGS		0	NO REGS	
PAH	benzo[a]pyrene	5	0.1	0.036	0.084	0.27	PASS		0.01	FURTHER ACTION	GWS1, others <LOD	0.7	PASS	
PAH	benzo[b]fluoranthene	5	0.11	0.038	0.092	0.017	FURTHER ACTION	GWS1, others <LOD	0.1	FURTHER ACTION	GWS1, others <LOD	0	NO REGS	
PAH	benzo[g,h,i]perylene	5	0.07	0.03	0.06	0.0082	FURTHER ACTION	GWS1, others <LOD	0.1	PASS		0	NO REGS	
PAH	benzo[k]fluoranthene	5	0.05	0.026	0.044	0.017	FURTHER ACTION	GWS1, others <LOD	0.1	PASS		0	NO REGS	
PAH	fluoranthene	5	0.11	0.038	0.092	0.12	PASS		0	NO REGS		0	NO REGS	
PAH	indeno[123-cd]pyrene	5	0.07	0.03	0.06	0.00017	FURTHER ACTION	GWS1, others <LOD	0.1	PASS		0	NO REGS	
PAH	napthalene	5	0.02	0.02	0.02	130	PASS		0	NO REGS		0	NO REGS	
FUEL	aliphatic EC 5-6	5	1	1	1	0	NO REGS		0	NO REGS		15000	PASS	
FUEL	aliphatic EC 6-8	5	1	1	1	0	NO REGS		0	NO REGS		15000	PASS	
FUEL	aliphatic EC 8-10	5	10	10	10	0	NO REGS		0	NO REGS		300	PASS	
FUEL	aliphatic EC 10-12	5	10	10	10	0	NO REGS		0	NO REGS		300	PASS	
FUEL	aliphatic EC 12-16	5	10	10	10	0	NO REGS		0	NO REGS		300	PASS	
FUEL	aliphatic EC 16-35	5	10	10	10	0	NO REGS		0	NO REGS		600	PASS	
FUEL	aliphatic EC 35-44	5	10	10	10	0	NO REGS		0	NO REGS		0	NO REGS	
FUEL	aromatic EC 5-7,Benzene	5	1	1	1	50	PASS		1	PASS		10	PASS	
FUEL	aromatic EC 7-8,Toluene	5	1	1	1	380	PASS		0	NO REGS		700	PASS	
FUEL	aromatic EC 8-10	5	10	10	10	0	NO REGS		0	NO REGS		300	PASS	
FUEL	aromatic EC 10-12	5	10	10	10	0	NO REGS		0	NO REGS		90	PASS	
FUEL	aromatic EC 12-16	5	10	10	10	0	NO REGS		0	NO REGS		90	PASS	
FUEL	aromatic EC 16-21	5	10	10	10	0	NO REGS		0	NO REGS		90	PASS	
FUEL	aromatic EC 21-35	5	20	20	20	0	NO REGS		0	NO REGS		90	PASS	
FUEL	aromatic EC 35-44	5	10	10	10	0	NO REGS		0	NO REGS		90	PASS	
VOC/BTEX	benzene	5	1	1	1	50	PASS		1	PASS		10	PASS	
VOC/BTEX	toluene	5	1	1	1	380	PASS		0	NO REGS		700	PASS	
VOC/BTEX	ethylbenzene	5	1	1	1	0	NO REGS		0	NO REGS		300	PASS	
VOC/BTEX	m-xylene	5	1	1	1	30	PASS		0	NO REGS		500	PASS	
VOC/BTEX	p-xylene	5	1	1	1	30	PASS		0	NO REGS		500	PASS	
VOC/BTEX	o-xylene	5	1	1	1	30	PASS		0	NO REGS		500	PASS	
SVOC	phenol	5	100	46	100	46	FURTHER ACTION	all below LOD	0	NO REGS	all below LOD	0	NO REGS	all below LOD

4.6. Envirolab – Soil Testing Certificates.

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number:	23/03663
Issue Number:	1 **Date:** 19 June, 2023
Client:	T J Booth Associates 20a East Gate Street Rochdale Rochdale Greater Manchester UK OL16 1DH
Project Manager:	Daniel Slattery
Project Name:	JAY - Albert Mill, Whitworth
Project Ref:	Not specified
Order No:	N/A
Date Samples Received:	19/04/23
Date Instructions Received:	19/04/23
Date Analysis Completed:	18/06/23

Approved by:

Hayder Naseer
Laboratory Supervisor

MCERTS UKAS TESTING 1247

Page 1 of 10

envirolab

Envirolab Job Number: 23/03663

Client Project Name: JAY - Albert Mill, Whitworth

Client Project Ref: Not specified

Lab Sample ID	23/03663/1	23/03663/2	23/03663/3	23/03663/4	23/03663/5	23/03663/6	23/03663/7	Units	Limit of Detection	Method ref
Client Sample No	S1	S2	S3	S4	S5	S6	S7			
Client Sample ID	TH1	TH2	TH3	TH4	TH6	TH8	TH7			
Depth to Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Depth To Bottom	0.80	0.50	0.90	0.50	1.00	0.50	0.50			
Date Sampled	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	1A	4AE	5AB	4A	4AB	4AB			
% Stones >10mm$_A$	<0.1	7.4	3.5	<0.1	<0.1	5.9	2.2	% w/w	0.1	A-T-044
pH$_D$	8.07	7.43	7.88	7.80	7.57	7.48	8.10	pH	0.01	A-T-031x
Sulphate (acid soluble)$_D$	2000	260	460	1200	2000	900	3800	mg/kg	200	A-T-028x
Cyanide (total)$_A$	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-042x/TCN
Phenols - Total by HPLC$_A$	<0.2	<0.2	<0.2	0.5	<0.2	<0.2	<0.2	mg/kg	0.2	A-T-066x
Sulphide$_A$	33	<5	21	<5	<5	<5	10	mg/kg	5	A-T-042-x
Sulphur (elemental)$_D$	33	7	82	9	21	15	7	mg/kg	5	A-T-029x
Organic Matter$_D$	18.4	2.4	12.0	14.7	27.4	23.5	17.7	% w/w	0.1	A-T-022x
Arsenic$_D$	11	<1	31	17	25	32	210	mg/kg	1	A-T-024x
Boron (water soluble)$_D$	<1.0	<1.0	<1.0	2.5	4.8	<1.0	<1.0	mg/kg	1	A-T-027x
Cadmium$_D$	1.1	0.8	1.1	1.0	1.2	1.2	3.1	mg/kg	0.5	A-T-024x
Copper$_D$	702	46	87	708	254	138	281	mg/kg	1	A-T-024x
Chromium$_D$	28	18	29	1260	617	45	188	mg/kg	1	A-T-024x
Chromium (hexavalent)$_D$	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040x
Lead$_D$	211	120	198	805	358	86	158	mg/kg	1	A-T-024x
Mercury$_D$	1.10	<0.17	<0.17	<0.17	<0.17	0.40	0.22	mg/kg	0.17	A-T-024x
Nickel$_D$	30	19	29	25	38	50	158	mg/kg	1	A-T-024x
Selenium$_D$	<1	<1	<1	3	3	<1	<1	mg/kg	1	A-T-024x
Zinc$_D$	184	71	97	383	244	101	153	mg/kg	5	A-T-024x
Ali >C8-C10$_A$	2	-	-	3	<10	-	-	mg/kg	1	A-T-066x
Ali >C10-C12$_A$	4	-	-	3	<10	-	-	mg/kg	1	A-T-066x
Ali >C12-C16$_A$	5	-	-	4	<10	-	-	mg/kg	1	A-T-066x
Ali >C16-C21$_A$	25	-	-	21	48	-	-	mg/kg	1	A-T-066x
Ali >C21-C35$_A$	225	-	-	606	832	-	-	mg/kg	1	A-T-066x
Total Aliphatics$_A$	#	-	-	#	#	-	-	mg/kg	1	Calc-As Recd
Aro >C8-C10$_A$	4	-	-	4	<10	-	-	mg/kg	1	A-T-066x
Aro >C10-C12$_A$	4	-	-	4	<10	-	-	mg/kg	1	A-T-066x
Aro >C12-C16$_A$	17	-	-	8	44	-	-	mg/kg	1	A-T-066x
Aro >C16-C21$_A$	78	-	-	34	172	-	-	mg/kg	1	A-T-066x
Aro >C21-C35$_A$	124	-	-	68	686	-	-	mg/kg	1	A-T-066x
Total Aromatics$_A$	#	-	-	#	#	-	-	mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C6-C35)$_A$	#	-	-	#	#	-	-	mg/kg	1	Calc-As Recd

envirolab

Envirolab Job Number: 23/03663

Client Project Name: JAY - Albert Mill, Whitworth

Client Project Ref: Not specified

Lab Sample ID	23/03663/1	23/03663/2	23/03663/3	23/03663/4	23/03663/5	23/03663/6	23/03663/7	Units	Limit of Detection	Method ref
Client Sample No	S1	S2	S3	S4	S5	S6	S7			
Client Sample ID	TH1	TH2	TH3	TH4	TH5	TH6	TH7			
Depth to Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Depth To Bottom	0.80	0.50	0.90	0.50	1.00	0.50	0.50			
Date Sampled	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	1A	4AE	5AB	4A	4AB	4AB			
Asbestos in Soil (inc. matrix)										
Asbestos in soil$_D$	Chrysotile	NAD	NAD	Chrysotile	Amosite	NAD	NAD			
Asbestos Matrix (visual)$_D$	-	-	-	-	-	-	-			
Asbestos Matrix (microscope)$_D$	Loose Fibres	-	-	Loose Fibres	Loose Fibres	-	-			
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing)$_D$	0.001	-	-	0.027	0.022	-	-	% w/w	0.001	
BTEX										
BTEX - Benzene$_A$	<0.01	-	-	<0.01	<0.01	-	-	mg/kg	0.01	
BTEX - Toluene$_A$	<0.01	-	-	<0.01	<0.01	-	-	mg/kg	0.01	
BTEX - Ethyl Benzene$_A$	<0.01	-	-	<0.01	<0.01	-	-	mg/kg	0.01	
BTEX - m & p Xylene$_A$	<0.01	-	-	<0.01	<0.01	-	-	mg/kg	0.01	
BTEX - o Xylene$_A$	<0.01	-	-	<0.01	<0.01	-	-	mg/kg	0.01	

envirolab

Envirolab Job Number: 23/03663

Client Project Name: JAY - Albert Mill, Whitworth

Client Project Ref: Not specified

Lab Sample ID	23/03663/1	23/03663/2	23/03663/3	23/03663/4	23/03663/5	23/03663/6	23/03663/7	Units	Limit of Detection	Method ref
Client Sample No	S1	S2	S3	S4	S5	S6	S7			
Client Sample ID	TH1	TH2	TH3	TH4	TH5	TH6	TH7			
Depth to Top	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Depth To Bottom	0.80	0.50	0.90	0.50	1.00	0.50	0.50			
Date Sampled	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23	17-Apr-23			
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL			
Sample Matrix Code	4AB	1A	4AE	5AB	4A	4AB	4AB			
PAH-16MS										
Acenaphthene$_A^M$	0.35	0.06	0.43	0.28	1.04	0.08	0.02	mg/kg	0.01	A/T-028a
Acenaphthylene$_A^M$	<0.01	<0.01	0.04	0.01	0.07	0.01	<0.01	mg/kg	0.01	A/T-028a
Anthracene$_A^M$	0.48	0.11	0.84	0.40	1.28	0.16	0.06	mg/kg	0.02	A/T-028a
Benzo(a)anthracene$_A^M$	0.91	0.27	2.38	1.48	5.86	0.71	0.17	mg/kg	0.04	A/T-028a
Benzo(a)pyrene$_A^M$	0.80	0.23	2.57	1.74	8.14	0.90	0.21	mg/kg	0.04	A/T-028a
Benzo(b)fluoranthene$_A^M$	1.12	0.32	3.87	2.29	11.1	1.17	0.29	mg/kg	0.05	A/T-028a
Benzo(ghi)perylene$_A^M$	0.44	0.13	1.87	0.92	5.73	0.53	0.12	mg/kg	0.05	A/T-028a
Benzo(k)fluoranthene$_A^M$	0.68[U]	0.18[U]	1.88[U]	1.23[U]	4.71[U]	0.82[U]	0.17[U]	mg/kg	0.07	A/T-028a
Chrysene$_A^M$	1.03	0.30	2.21	1.29	5.38	0.60	0.15	mg/kg	0.06	A/T-028a
Dibenzo(ah)anthracene$_A^M$	0.10	<0.04	0.35	0.18	0.79	0.11	<0.04	mg/kg	0.04	A/T-028a
Fluoranthene$_A^M$	2.44	0.42	5.48	3.34	13.8	1.28	0.32	mg/kg	0.08	A/T-028a
Fluorene$_A^M$	0.21	0.03	0.23	0.18	0.55	0.06	0.01	mg/kg	0.01	A/T-028a
Indeno(123-cd)pyrene$_A^M$	0.42	0.13	1.87	0.88	5.12	0.55	0.13	mg/kg	0.03	A/T-028a
Naphthalene $_A^M$	0.17	0.08	0.18	0.12	0.34	0.11	0.10	mg/kg	0.03	A/T-028a
Phenanthrene$_A^M$	2.08	0.45	3.30	1.84	5.86	0.82	0.23	mg/kg	0.03	A/T-028a
Pyrene$_A^M$	2.01	0.42	4.47	2.82	11.8	1.09	0.27	mg/kg	0.07	A/T-028a
Total PAH-16MS$_A^M$	13.1	3.13	31.4	18.9	82.4	8.54	2.24	mg/kg	0.01	A/T-028a

envirolab

Envirolab Job Number: 23/03663

Client Project Name: JAY - Albert Mill, Whitworth

Client Project Ref: Not specified

Lab Sample ID	23/03663/8							Units	Limit of Detection	Method ref
Client Sample No	88									
Client Sample ID	Stockpile									
Depth to Top										
Depth To Bottom										
Date Sampled	17-Apr-23									
Sample Type	SOIL									
Sample Matrix Code	4A									
Asbestos in Soil (Inc. matrix)										
Asbestos in soil$_D$#	Amosite									A-T-045
Asbestos Matrix (visual)$_D$	-									A-T-045
Asbestos Matrix (microscope)$_D$	Loose Fibres									A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A									A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing)$_D$	<0.001							% w/w	0.001	A-T-054

envirolab

Envirolab Job Number: 23/03663

Client Project Name: JAY - Albert Mill, Whitworth

Client Project Ref: Not specified

Lab Sample ID	23/03663/8							Units	Limit of Detection	Method ref
Client Sample No	88									
Client Sample ID	Stockpile									
Depth to Top										
Depth To Bottom										
Date Sampled	17-Apr-23									
Sample Type	SOIL									
Sample Matrix Code	4A									
PAH-16MS										
Acenaphthene$_A^{MU}$	3.27							mg/kg	0.01	A-T-029s
Acenaphthylene$_A^{MU}$	0.10							mg/kg	0.01	A-T-029s
Anthracene$_A^{MU}$	4.00							mg/kg	0.02	A-T-029s
Benzo(a)anthracene$_A^{MU}$	10							mg/kg	0.04	A-T-029s
Benzo(a)pyrene$_A^{MU}$	12.4							mg/kg	0.04	A-T-029s
Benzo(b)fluoranthene$_A^{MU}$	15.2							mg/kg	0.05	A-T-029s
Benzo(ghi)perylene$_A^{MU}$	6.83							mg/kg	0.05	A-T-029s
Benzo(k)fluoranthene$_A^{MU}$	6.80[J]							mg/kg	0.07	A-T-029s
Chrysene$_A^{MU}$	8.84							mg/kg	0.06	A-T-029s
Dibenzo(ah)anthracene$_A^{MU}$	0.83							mg/kg	0.04	A-T-029s
Fluoranthene$_A^{MU}$	25.8							mg/kg	0.08	A-T-029s
Fluorene$_A^{MU}$	1.87							mg/kg	0.01	A-T-029s
Indeno(123-cd)pyrene$_A^{MU}$	6.89							mg/kg	0.03	A-T-029s
Naphthalene $_A^{MU}$	3.09							mg/kg	0.03	A-T-029s
Phenanthrene$_A^{MU}$	17							mg/kg	0.03	A-T-029s
Pyrene$_A^{MU}$	22.2							mg/kg	0.07	A-T-029s
Total PAH-16MS$_A^{MU}$	143							mg/kg	0.01	A-T-029s

envirolab

Report Notes

General
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received within the same delivery, will be disposed of six weeks after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside our scope of accreditation.
The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Key

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

Asbestos
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing, and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is NOT included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25ºC / 11550µS/cm @ 20ºC fall outside the accreditation range and as such are unaccredited.

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

envirolab

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: T J Booth Associates, 20a East Gate Street, Rochdale, Rochdale, Greater Manchester, UK, OL16 1DH
Project: JAY - Albert Mill, Whitworth
Clients Project No:

Project No: 23/03663
Date Received: 19/04/2023 (am)
Cool Box Temperatures (°C): 17.8

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.
Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples 5 ± 3°C), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

envirolab

Envirolab Analysis Dates

Lab Sample ID	23/03663/1	23/03663/2	23/03663/3	23/03663/4	23/03663/5	23/03663/6	23/03663/7	23/03663/8
Client Sample No	S1	S2	S3	S4	S5	S6	S7	S8
Client Sample ID/Depth	TH1 0.00-0.80m	TH2 0.00-0.50m	TH3 0.00-0.90m	TH4 0.00-0.50m	TH5 0.00-1.00m	TH6 0.00-0.50m	TH7 0.00-0.50m	Stockpile
Date Sampled	17/04/23	17/04/23	17/04/23	17/04/23	17/04/23	17/04/23	17/04/23	17/04/23
A-T-019s	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023
A-T-022s	24/04/2023			24/04/2023	24/04/2023			
A-T-024s	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023
A-T-027s	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023
A-T-028s	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023
A-T-029s	02/05/2023	28/04/2023	02/05/2023	28/04/2023	28/04/2023	28/04/2023	28/04/2023	28/04/2023
A-T-031s	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023
A-T-032s	28/04/2023	28/04/2023	28/04/2023	28/04/2023	28/04/2023	02/05/2023	02/05/2023	28/04/2023
A-T-040s	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023
A-T-042sTCN	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023
A-T-043-s	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023	24/04/2023
A-T-044	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023	03/05/2023
A-T-045	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023	20/04/2023
A-T-050s	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023	02/05/2023
A-T-054	18/06/2023			18/06/2023	18/06/2023			18/06/2023
A-T-055s	24/04/2023			24/04/2023	24/04/2023			
Calc-As Recd	27/04/2023			27/04/2023	27/04/2023			

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

End of Report

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 23/07359
Issue Number: 1 **Date:** 07 August, 2023

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

Project Manager: Daniel Slattery
Project Name: JAY - Albert Mill
Project Ref: Not specified
Order No: N/A
Date Samples Received: 21/07/23
Date Instructions Received: 24/07/23
Date Analysis Completed: 07/08/23

Approved by:

Richard Wong
Client Manager

UKAS TESTING
1247

envirolab

Envirolab Job Number: 23/07359

Client Project Name: JAY - Albert Mill

Client Project Ref: Not specified

Lab Sample ID	23/07359/1	23/07359/2	23/07359/3	23/07359/4	23/07359/5			Units	Limit of Detection	Method ref
Client Sample No	GWS1	GWS2	WS1	WS2	WS3					
Client Sample ID	TH8	TH9	River	River	River					
Depth to Top	2.40	2.60								
Depth To Bottom										
Date Sampled	20-Jul-23	20-Jul-23	20-Jul-23	20-Jul-23	20-Jul-23					
Sample Type	WATER - GW	WATER - GW	WATER - EW	WATER - EW	WATER - EW					
Sample Matrix Code	N/A	N/A	N/A	N/A	N/A					
pH (w)$_A$*	7.62	6.90	7.13	7.12	7.07			pH	0.01	A-T-031w
Hardness Total$_A$*	296	226	53	50	50			mg/l Ca CO3	2	A-T-049w
Sulphate (w)$_A$*	147	60	19	19	19			mg/l	1	A-T-029w
Cyanide (total) (w)$_A$*	<0.005	<0.005	<0.005	<0.005	<0.005			mg/l	0.005	A-T-042wTCN
Phenols - Total by HPLC (w)$_A$	<0.10	<0.10	<0.01	<0.01	<0.01			mg/l	0.01	A-T-050w
DOC - Dissolved Organic Carbon (w)$_A$*	4.1	3.6	2.9	3.0	3.0			mg/l	2	A-T-032w
Arsenic (dissolved)$_A$*	<1	<1	<1	<1	<1			µg/l	1	A-T-025w
Cadmium (dissolved)$_A$*	<0.2	<0.2	<0.2	<0.2	<0.2			µg/l	0.2	A-T-025w
Copper (dissolved)$_A$	<4	<4	<4	<4	<4			µg/l	4	A-T-025w
Chromium (dissolved)$_A$*	<1	<1	7	7	6			µg/l	1	A-T-025w
Chromium (hexavalent) (w)$_A$*	<0.01	<0.01	<0.01	<0.01	<0.01			mg/l	0.01	A-T-040w
Lead (dissolved)$_A$*	<1	<1	<1	<1	<1			µg/l	1	A-T-025w
Mercury (dissolved)$_A$*	<0.1	<0.1	<0.1	<0.1	<0.1			µg/l	0.1	A-T-025w
Nickel (dissolved)$_A$*	2	<2	<2	<2	<2			µg/l	2	A-T-025w
Selenium (dissolved)$_A$*	<1	<1	<1	<1	<1			µg/l	1	A-T-025w
Sulphur, Total (dissolved)$_A$	54	22	8	7	7			mg/l	1	A-T-072w
Zinc (dissolved)$_A$*	<2	<2	2	3	<2			µg/l	2	A-T-025w

envirolab

Envirolab Job Number: 23/07359

Client Project Name: JAY - Albert Mill

Client Project Ref: Not specified

Lab Sample ID	23/07359/1	23/07359/2	23/07359/3	23/07359/4	23/07359/5			Units	Limit of Detection	Method ref
Client Sample No	GWS1	GWS2	WS1	WS2	WS3					
Client Sample ID	TH8	TH9	River	River	River					
Depth to Top	2.40	2.60								
Depth To Bottom										
Date Sampled	20-Jul-23	20-Jul-23	20-Jul-23	20-Jul-23	20-Jul-23					
Sample Type	WATER - GW	WATER - GW	WATER - EW	WATER - EW	WATER - EW					
Sample Matrix Code	N/A	N/A	N/A	N/A	N/A					
PAH 16MS (w)										
Acenaphthene (w)$_A$*	<0.02	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Acenaphthylene (w)$_A$*	<0.02	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Anthracene (w)$_A$*	<0.02	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Benzo(a)anthracene (w)$_A$*	0.06^U	<0.02^U	<0.02^U	<0.02^U	<0.02^U			µg/l	0.01	A-T-019w
Benzo(a)pyrene (w)$_A$*	0.10	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Benzo(b)fluoranthene (w)$_A$*	0.11	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Benzo(ghi)perylene (w)$_A$*	0.07	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Benzo(k)fluoranthene (w)$_A$*	0.05	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Chrysene (w)$_A$*	0.08	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Dibenzo(ah)anthracene (w)$_A$*	<0.02	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Fluoranthene (w)$_A$*	0.11	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Fluorene (w)$_A$*	<0.02	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Indeno(123-cd)pyrene (w)$_A$*	0.07	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Naphthalene (w)$_A$*	<0.02	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Phenanthrene (w)$_A$*	<0.02	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Pyrene (w)$_A$*	0.11	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w
Total PAH 16MS (w)$_A$*	0.76	<0.02	<0.02	<0.02	<0.02			µg/l	0.01	A-T-019w

envirolab

Envirolab Job Number: 23/07359

Client Project Name: JAY - Albert Mill

Client Project Ref: Not specified

Lab Sample ID	23/07359/1	23/07359/2	23/07359/3	23/07359/4	23/07359/5			Units	Limit of Detection	Method ref
Client Sample No	GWS1	GWS2	WS1	WS2	WS3					
Client Sample ID	TH8	TH9	River	River	River					
Depth to Top	2.40	2.60								
Depth To Bottom										
Date Sampled	20-Jul-23	20-Jul-23	20-Jul-23	20-Jul-23	20-Jul-23					
Sample Type	WATER - GW	WATER - GW	WATER - EW	WATER - EW	WATER - EW					
Sample Matrix Code	N/A	N/A	N/A	N/A	N/A					
TPH UKCWG (w) with Clean Up										
All >C5-C6 (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
All >C6-C8 (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
All >C8-C10 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
All >C10-C12 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
All >C12-C16 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
All >C16-C21 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
All >C21-C35 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
All >C35-C44 (w)$_A$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
Total Aliphatics (w)$_A$	<10	<10	<10	<10	<10			µg/l	5	Calc-As Recd
Aro >C5-C7 (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
Aro >C7-C8 (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
Aro >C8-C10 (w)$_A$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
Aro >C10-C12 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
Aro >C12-C16 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
Aro >C16-C21 (w)$_A^*$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
Aro >C21-C35 (w)$_A$	<20	<20	<20	<20	<20			µg/l	10	A-T-058w
Aro >C35-C44 (w)$_A$	<10	<10	<10	<10	<10			µg/l	5	A-T-058w
Total Aromatics (w)$_A$	<20	<20	<20	<20	<20			µg/l	10	Calc-As Recd
TPH (All & Aro >C5-C44) (w)$_A$	<20	<20	<20	<20	<20			µg/l	10	Calc-As Recd
BTEX - Benzene (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
BTEX - Toluene (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
BTEX - Ethyl Benzene (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
BTEX - m & p Xylene (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
BTEX - o Xylene (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w
MTBE (w)$_A^*$	<1	<1	<1	<1	<1			µg/l	1	A-T-022w

envirolab

Report Notes

General
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **six weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and Interpretations expressed are outside our scope of accreditation.
The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client.
A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

Key

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

Asbestos
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing, and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matricse are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25ºC / 11550µS/cm @ 20ºC fall outside the accreditation range and as such are unaccredited.

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

envirolab

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: T J Booth Associates, 20a East Gate Street, Rochdale, Rochdale, Greater Manchester, UK, OL16 1DH
Project: JAY - Albert Mill
Clients Project No:

Project No: 23/07359
Date Received: 24/07/2023 (am)
Cool Box Temperatures (°C): 15.1

Lab Sample ID	23/07359/1	23/07359/2	23/07359/3	23/07359/4	23/07359/5
Client Sample No	GWS1	GWS2	WS1	WS2	WS3
Client Sample ID/Depth	TH8 2.40m	TH9 2.60m	River	River	River
Date Sampled	20/07/23	20/07/23	20/07/23	20/07/23	20/07/23
Deviation Code					
B1 (no VPH)	✓	✓			✓
A7 (no HNO3)	✓	✓	✓	✓	✓
A9 (no H2SO4)	✓	✓	✓	✓	✓
G1 (VPH)	✓	✓			✓

Key

B1 (no VPH)	*Separate container not supplied for VPH/BTEX analysis*
A7 (no HNO3)	*No HNO3 preserved bottle provided (dissolved metals will be deviating)*
A9 (no H2SO4)	*No H2SO4 preserved bottle provided (phenols, ammonia, DOC, COD will be deviating)*
G1 (VPH)	*Headspace included in VPH/BTEX containers due to repeat analysis*

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples 5 ± 3°C), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

envirolab

Envirolab Analysis Dates

Lab Sample ID	23/07359/1	23/07359/2	23/07359/3	23/07359/4	23/07359/5
Client Sample No	GWS1	GWS2	WS1	WS2	WS3
Client Sample ID/Depth	TH8 2.40m	TH9 2.60m	River	River	River
Date Sampled	20/07/23	20/07/23	20/07/23	20/07/23	20/07/23
A-T-019w	31/07/2023	31/07/2023	31/07/2023	31/07/2023	31/07/2023
A-T-022w	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023
A-T-025w	31/07/2023	31/07/2023	31/07/2023	31/07/2023	31/07/2023
A-T-026w	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023
A-T-031w	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023
A-T-032w	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023
A-T-040w	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023
A-T-042wTCN	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023
A-T-049w	31/07/2023	31/07/2023	31/07/2023	31/07/2023	31/07/2023
A-T-050w	07/08/2023	07/08/2023	04/08/2023	04/08/2023	04/08/2023
A-T-055w	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023
A-T-072w	31/07/2023	31/07/2023	31/07/2023	31/07/2023	31/07/2023
Calc-As Recd	28/07/2023	28/07/2023	28/07/2023	28/07/2023	28/07/2023

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

End of Report

5. APPENDIX B: SITE INVESTIGATION PHOTOS.

Trial Hole 1.

Trial Hole 2.

Trial Hole 3.

Trial Hole 4.

Trial Hole 5.

Trial Hole 6.

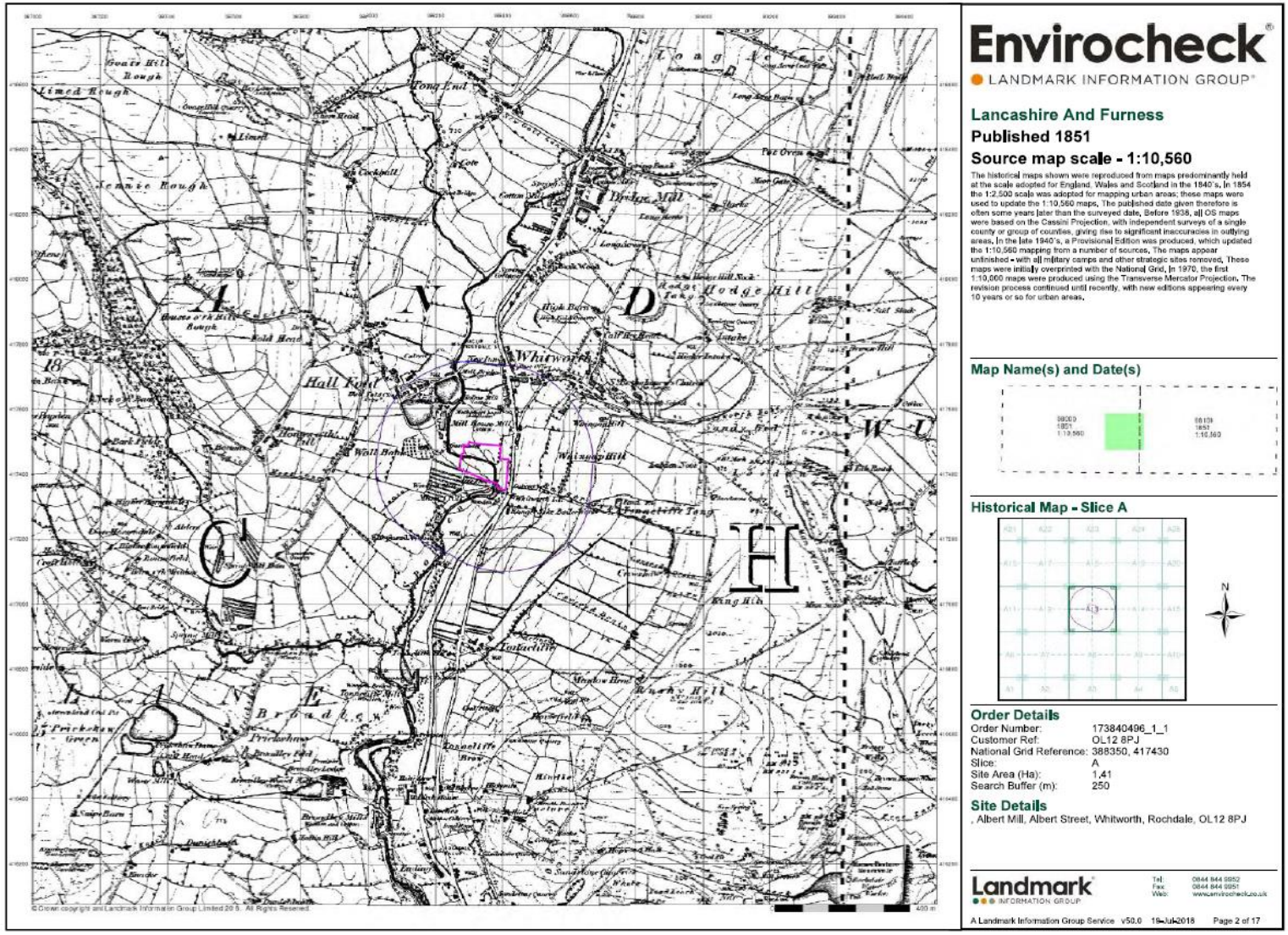
Trial Hole 7.

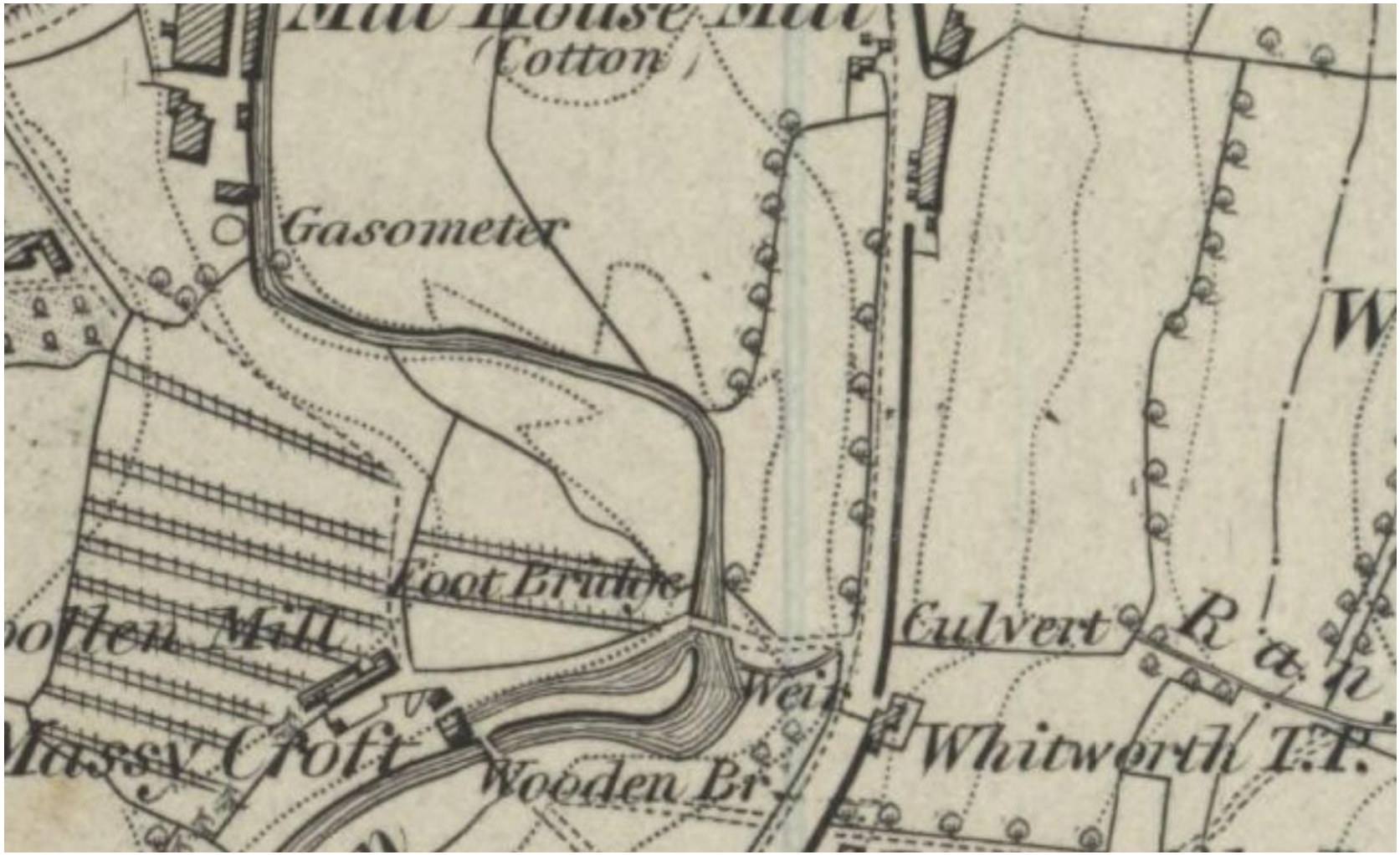
Soil sample 8 location.

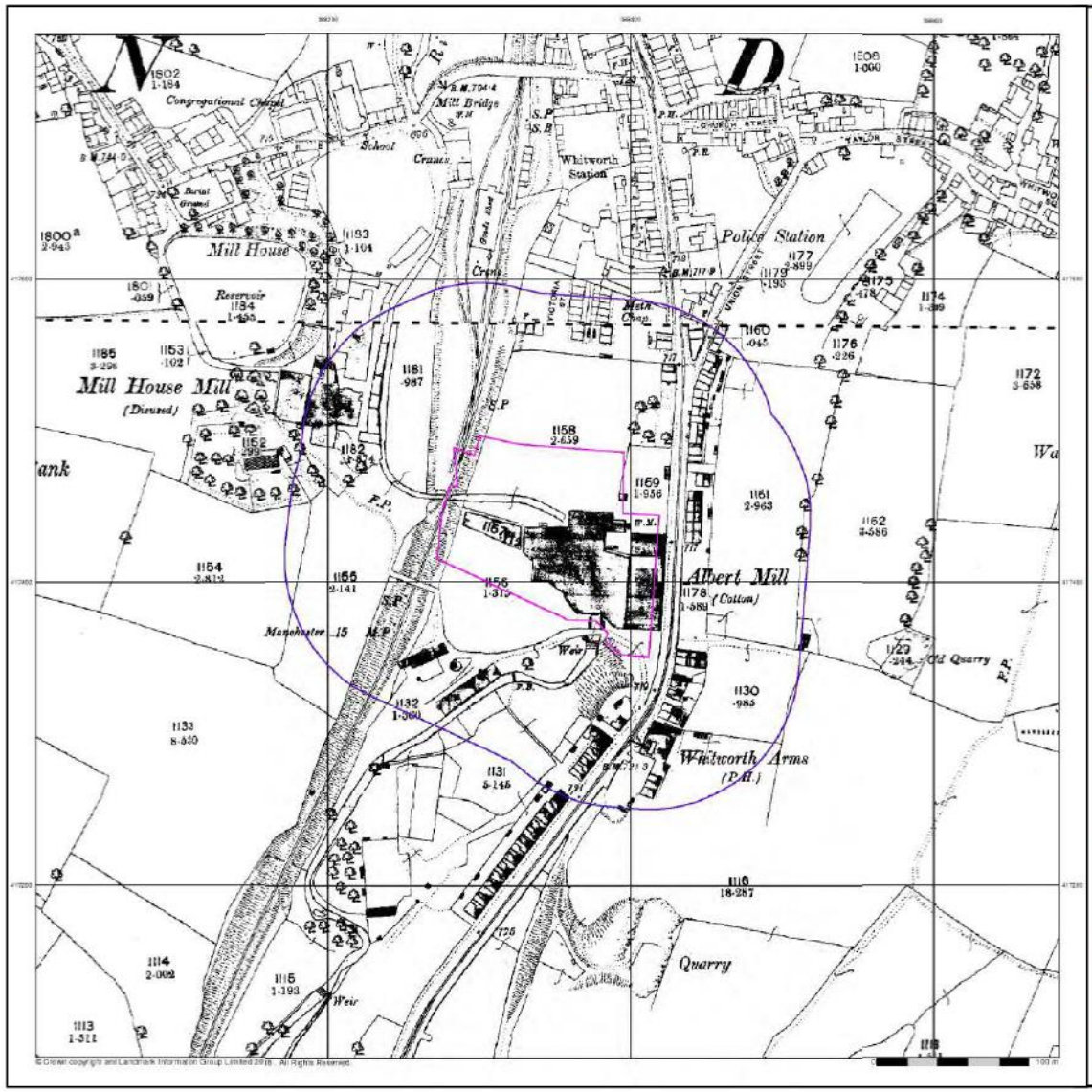
Trial Hole 8.

Trial Hole 9.

6. APPENDIX C: HISTORIC MAPS & SUPPORTING DOCUMENTATION.




Cotton
Gasometer
Foot Bridge
Culvert
Weir
Wooden Br
Whitworth I.F.



Envirocheck

LANDMARK INFORMATION GROUP

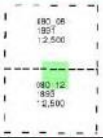
Lancashire And Furness

Published 1891 - 1893

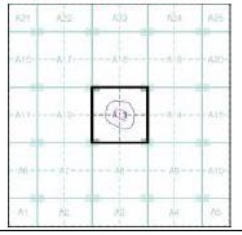
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	173840496_1_1
Customer Ref:	OL12 8PJ
National Grid Reference:	388350, 417430
Slice:	A
Site Area (Ha):	1.41
Search Buffer (m):	100

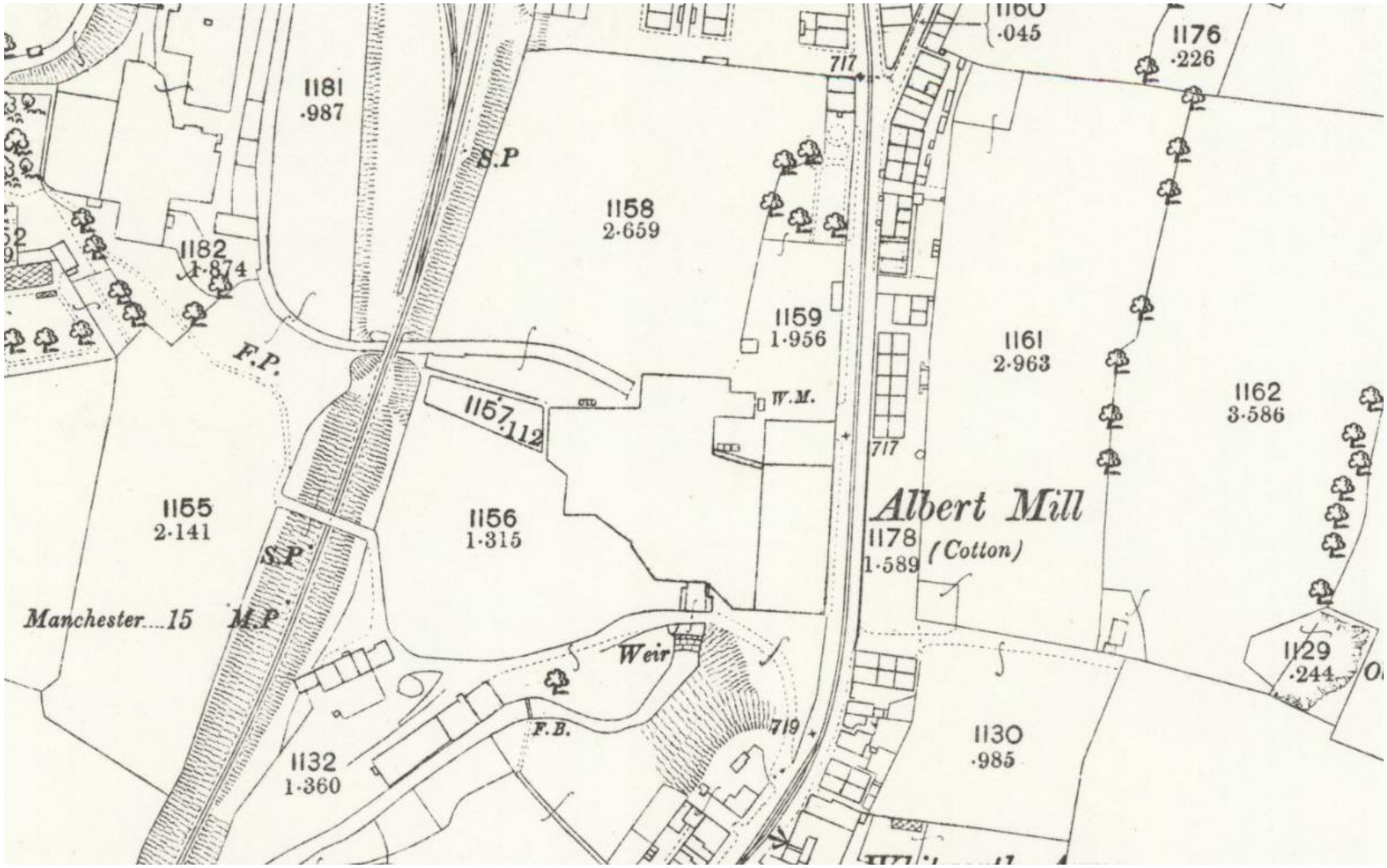
Site Details

, Albert Mill, Albert Street, Whitworth, Rochdale, OL12 8PJ

Landmark INFORMATION GROUP

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

A Landmark Information Group Service v50.0 19-Jul-2018 Page 2 of 11


1181
·987
S.P
1158
2·659
1182
1·874
F.P.
1159
1·956
W.M.
1157
1·12
1161
2·963
1162
3·586
717
1160
·045
1176
·226
Albert Mill
(Cotton)
1178
1·589
1155
2·141
S.P
1156
1·315
Manchester....15
M.P
Weir
F.B.
719
1132
1·360
1130
·985
1129
·244

Envirocheck®

LANDMARK INFORMATION GROUP®

Lancashire And Furness

Published 1910

Source map scale - 1:2,500

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

Map Name(s) and Date(s)

080_08
1910
1:2,500

080_12
1910
1:2,500

Historical Map - Segment A13

Order Details

Order Number: 173840496_1_1
Customer Ref: OL12 8PJ
National Grid Reference: 388350, 417430
Slice: A
Site Area (Ha): 1.41
Search Buffer (m): 100

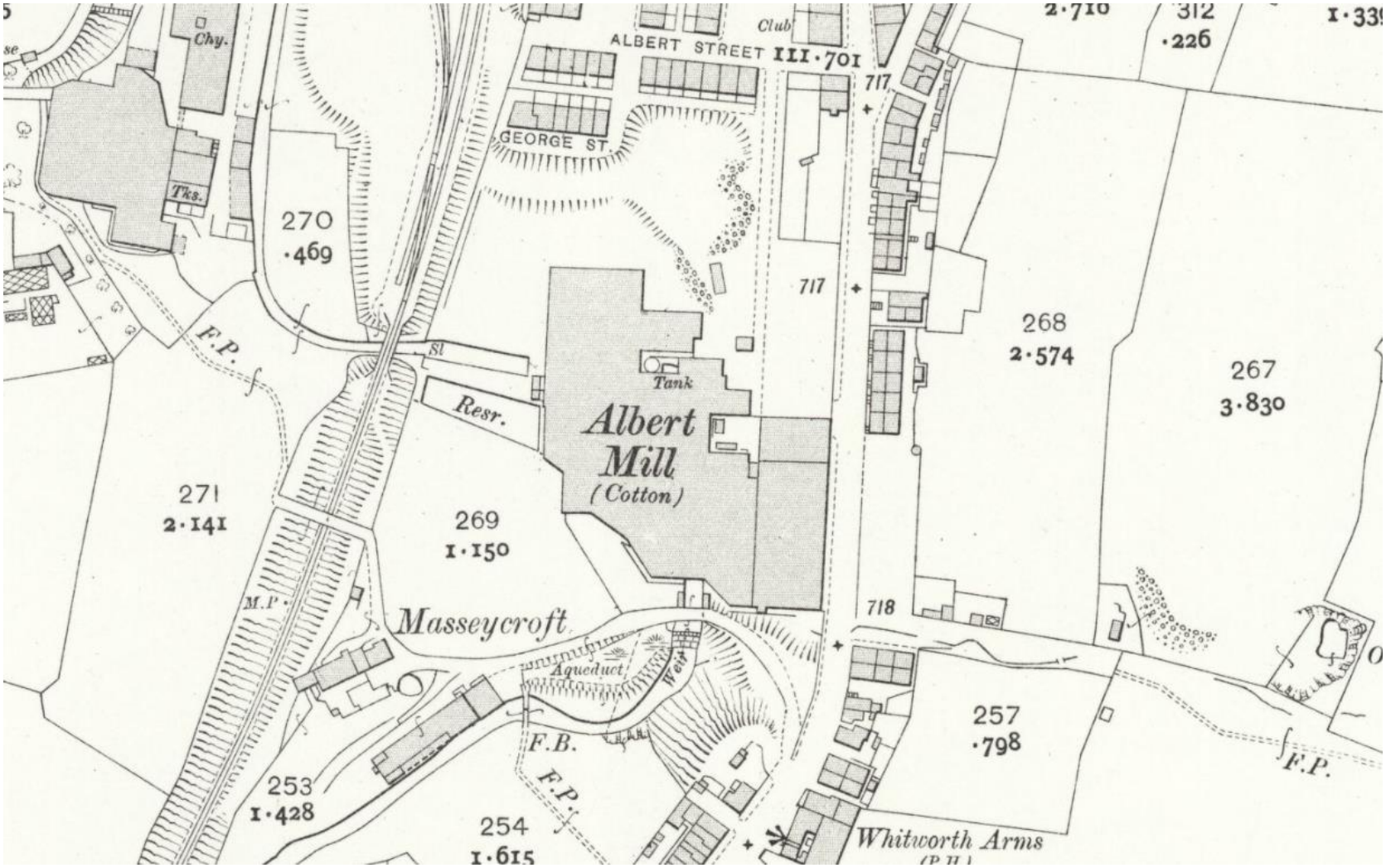
Site Details

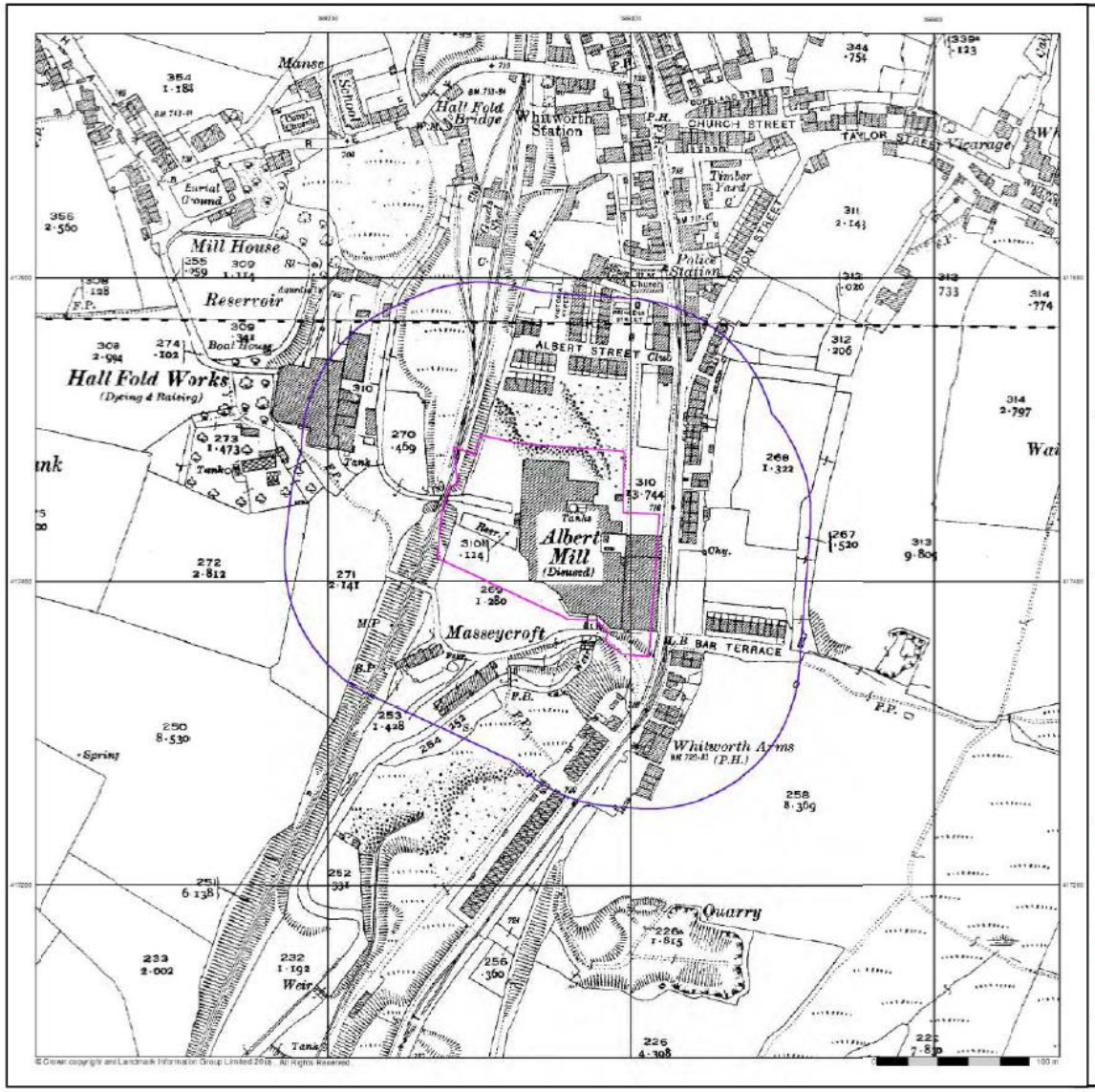
, Albert Mill, Albert Street, Whitworth, Rochdale, OL12 8PJ

Landmark INFORMATION GROUP

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

A Landmark Information Group Service v50.0 19-Jul-2018 Page 3 of 11


ALBERT STREET
III·701
Club
Chy.
Tks.
GEORGE ST.
270
·469
F.P.
St
Resr.
Tank
Albert
Mill
(Cotton)
717
268
2·574
267
3·830
271
2·141
269
1·150
M.P.
Masseycroft
Aqueduct
Weir
718
257
·798
F.B.
F.P.
253
1·428
254
1·615
Whitworth Arms
2·716
312
·226
1·339



Envirocheck

LANDMARK INFORMATION GROUP

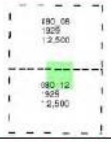
Lancashire And Furness

Published 1929

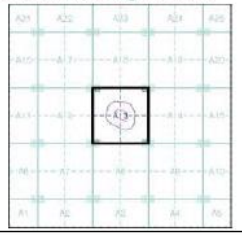
Source map scale - 1:2,500

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

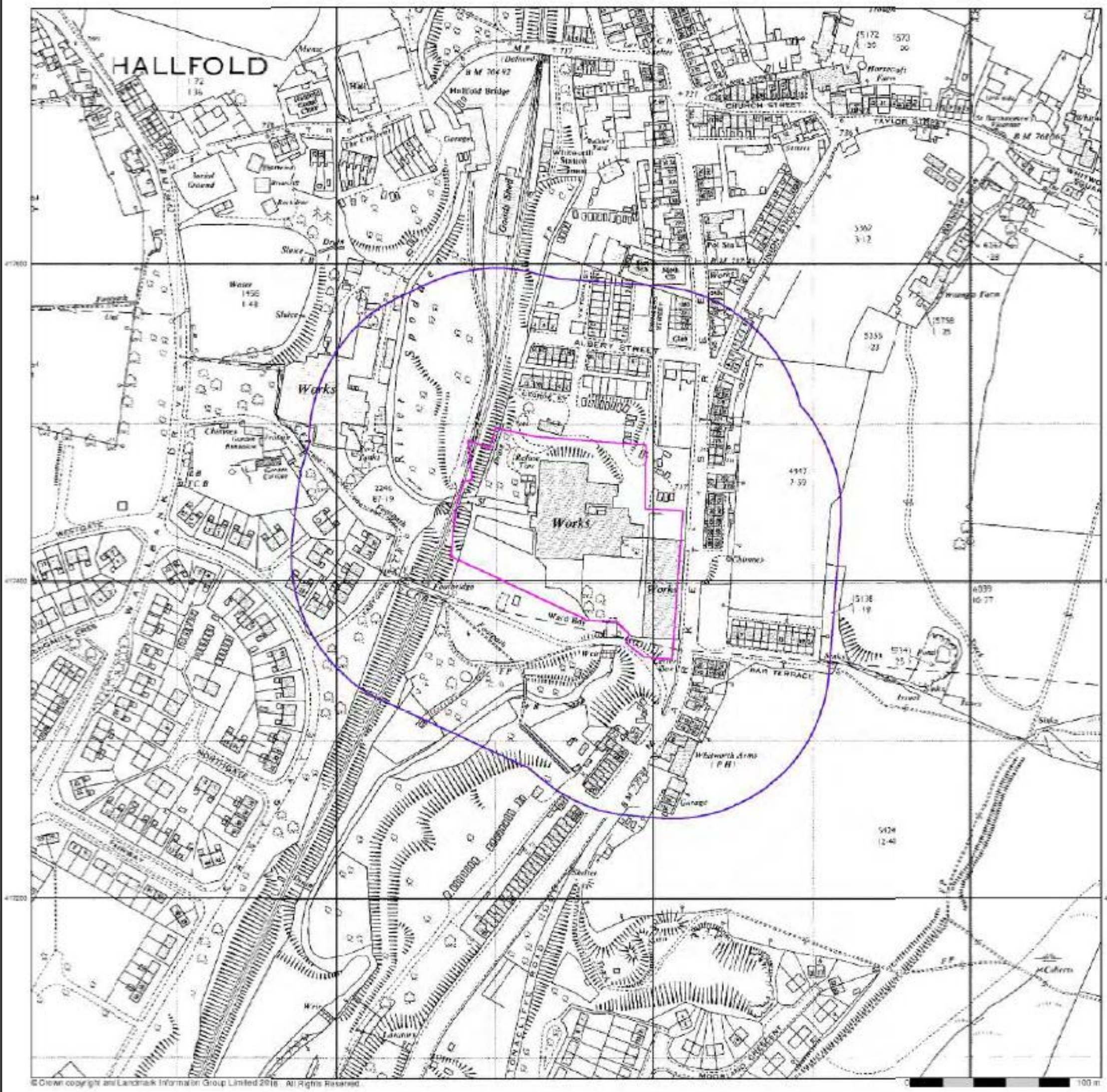
Order Number:	173840496_1_1
Customer Ref:	OL12 8PJ
National Grid Reference:	388350, 417430
Slice:	A
Site Area (Ha):	1.41
Search Buffer (m):	100

Site Details

, Albert Mill, Albert Street, Whitworth, Rochdale, OL12 8PJ

Landmark INFORMATION GROUP

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



Envirocheck

LANDMARK INFORMATION GROUP

Ordnance Survey Plan

Published 1964

Source map scale - 1:2,500

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

Map Name(s) and Date(s)

SD8817
1964
1:2,500

Historical Map - Segment A13

Order Details

Order Number: 173840496_1_1
Customer Ref: OL12 8PJ
National Grid Reference: 388350, 417430
Slice: A
Site Area (Ha): 1.41
Search Buffer (m): 100

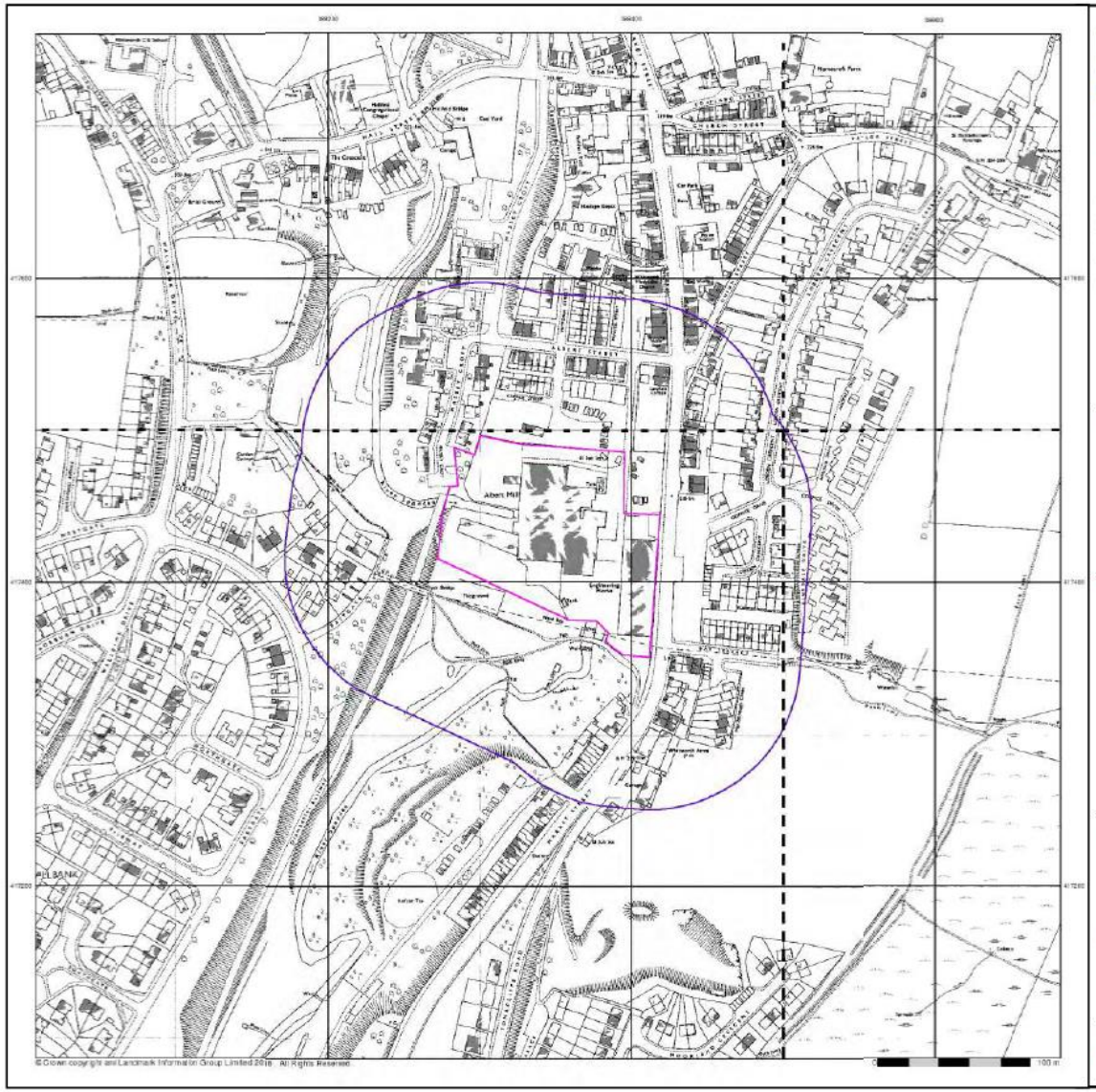
Site Details

, Albert Mill, Albert Street, Whitworth, Rochdale, OL12 8PJ

Landmark INFORMATION GROUP

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

A Landmark Information Group Service v50.0 19-Jul-2018 Page 5 of 11

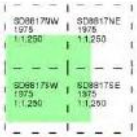


Envirocheck®
LANDMARK INFORMATION GROUP®

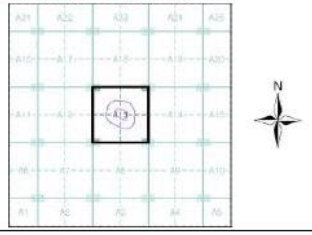
Ordnance Survey Plan
Published 1975
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	173840496_1_1
Customer Ref:	OL12 8PJ
National Grid Reference:	388350, 417430
Slice:	A
Site Area (Ha):	1.41
Search Buffer (m):	100

Site Details

, Albert Mill, Albert Street, Whitworth, Rochdale, OL12 8PJ

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

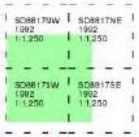
A Landmark Information Group Service v50.0 19-Jul-2018 Page 6 of 11

Envirocheck
LANDMARK INFORMATION GROUP

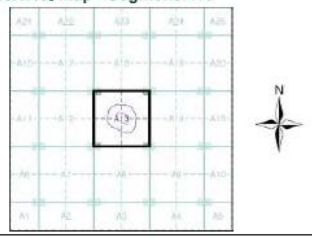
Large-Scale National Grid Data
Published 1992
Source map scale - 1:1,250

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

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	173840496_1_1
Customer Ref:	OL12 8PJ
National Grid Reference:	388350, 417430
Slice:	A
Site Area (Ha):	1.41
Search Buffer (m):	100

Site Details

, Albert Mill, Albert Street, Whitworth, Rochdale, OL12 8PJ

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

A Landmark Information Group Service v50.0 19-Jul-2018 Page 8 of 11