



67 Old Market Street,
Blackley, Manchester
Remediation Strategy and
Verification Plan

For FJB Construction Limited

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1. INTRODUCTION

1.1 Background and Terms of Reference

Hydrock Consultants Limited (Hydrock) has been commissioned by FJB Construction to prepare a Remediation Strategy and Verification Plan (RSVP) for the redevelopment at the site at 67 Old Market Street, Blackley, Manchester, M9 8DX.

In February 2018 ECUS Environmental Consultants issued a 'Phase 1 Geo-environmental Desk Study Report' (Report reference RZ/11031/180205/P1, and in December 2019 Egniol Environmental Limited issued a 'Phase II Geo-environmental Investigation' (Report reference EEL.762.R06.001).

This report is intended to fulfil the criteria of paragraph 3 of condition 25 of the planning permission (Remediation Strategy)

25) Notwithstanding details submitted, before the development hereby approved commences, a report (the Preliminary Risk Assessment) to identify and evaluate all potential sources and impacts of any ground contamination, groundwater contamination and/or ground gas relevant to the site shall be submitted to and approved in writing by the City Council as local planning authority. The Preliminary Risk Assessment shall conform to City Council's current guidance document (Planning Guidance in Relation to Ground Contamination).

In the event of the Preliminary Risk Assessment identifying risks which in the written opinion of the Local Planning Authority require further investigation, the development shall not commence until a scheme for the investigation of the site and the identification of remediation measures (the Site Investigation Proposal) has been submitted to and approved in writing by the City Council as local planning authority.

The measures for investigating the site identified in the Site Investigation Proposal shall be carried out, before the development commences and a report prepared outlining what measures, if any, are required to remediate the land (the Site Investigation Report and/or Remediation Strategy) which shall be submitted to and approved in writing by the City Council as local planning authority.

Reason - To ensure that the presence of or the potential for any contaminated land and/or groundwater is detected and appropriate remedial action is taken in the interests of public safety, pursuant to policies DM1 and EN18 of the Core Strategy.

The submitted Egniol Environmental Phase II report refers to a ECUS Phase I report which should be submitted for review.

The Existing Phase II Site Investigation is limited in scope due to access constraints with the existing buildings, and as such this RSVP should be considered preliminary and updated (if required) once the findings of any post-demolition site investigation has been carried out.

The Phase II Ground investigation indicated asbestos fibres (chrysotile) were present at the quantification limit of 0.001% within the Made Ground in one location, and further post-demolition delineation ground investigation was recommended in order to ascertain whether an Asbestos Management Plan (AMP) is required.

This RSVP is intended to be submitted as part of the planning application for the proposed development.

1.2 The Site

The site is located at 67 Old Market Street, Blackley, Manchester, M9 8DX (National Grid Reference 385480E 402920N).

The site currently comprises a disused mill, with a small parking area, and a cobbled access track in the centre of the site.

It is understood that the proposed development is to comprise a four-storey residential apartment block with associated parking and small areas of landscaping.

The proposed development layout is shown on the Indicative Landscape Strategy (Smashbox drawing 6479_L01, dated February 2020), enclosed at Appendix A.

1.3 Objectives

The objective of this RSVP is to present details of the remedial objectives, undertake a remedial options appraisal; describe how the remediation of the site will be undertaken; and outline how the works will be validated. In addition, the strategy explains how the works will be permitted under the current regulatory regime.

The remedial works will ensure that upon completion, the ground conditions at the site can be shown to be appropriate for its intended use and that it will not pose an unacceptable contamination risk to identified receptors. This document therefore includes the protective measures required during the enabling works and construction phases in preparing the site for a residential end use.

This is a working document and it may need to be updated, in agreement with the relevant regulatory bodies, at any stage during development dependent on the conditions encountered. This version therefore constitutes 17978-HYD-XX-XX-RP-GE-0001-P01. This document is subject to the approval of the regulators.

This strategy forms part of a series of documents produced for the site and provides an overview of the site development proposals and discusses remediation procedures.

This document does not cover the geotechnical requirements for the development which will be covered in a separate Geotechnical Design Report and Earthworks Specification.

1.4 Scope

This report has been undertaken in general accordance with Land Contamination: Risk Management (LCRM) (Environment Agency, 2019). The scope of this Remedial Options Appraisal and Remediation Strategy comprises:

- a summary of background information and the conceptual model;
- a summary of the results of risk assessment undertaken at the site;
- a remediation options assessment including selection of final remediation options; and
- methodology and verification requirement for remediation works.

1.5 Sources of Information

In preparing the remediation strategy the following documents were consulted and should be read in conjunction with it:

- ECUS Environmental Consultants, Phase 1 Geo-environmental Desk Study Report, Ref: RZ/11031/180205/P1, Date: February 2018.
- Egniol Environmental Consultants Ltd, Phase 2 Geo-environmental Investigation, Ref: EEL.7965.R06.001, Date: December 2019.
- Planning decision notice 126507/FO/2020.
- Site location and layout, elevations, boundary treatment and landscape strategy plans from the planning portal (produced by Smashbox).

1.6 Limitations

The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, all potential environmental constraints or liabilities associated with the site may not have been revealed.

The report has been prepared for the exclusive benefit of FJB Construction Limited and those parties designated by them for the purpose of providing information on the remediation and validation works to be undertaken during the enabling works and construction phases of the development. The report contents should only be used in that context. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

Hydrock has used reasonable skill, care and diligence in the design of the remediation of the site. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths of trial pits and boreholes at the time of the investigation. At intermediate locations, conditions can only be inferred. Information provided by third parties has been used in good faith and is taken at face value. However, Hydrock cannot guarantee the accuracy or completeness of any information provided by others.

The work has been carried out in general accordance with recognised best practice as detailed in guidance documents such as in the 'Land Contamination: Risk Management' (LCRM, 2019), BS5930:2015+A1:2020 and BS10175: 2011+A2:2017.

2. CONCEPTUAL SITE MODEL

2.1 Context

This section presents a summary of the conceptual model pertaining to the site which was developed in the Phase 1 Desk Study Report and later refined in the Phase 2 Ground Investigation Report. These reports are referenced in Section 1.5 and should be referred to for full details.

2.2 Site Location and Current Land Use

The site is located at 67 Old Market Street, Blackley, Manchester, M9 8DX (National Grid Reference 385480E 402920N).

The site currently comprises a disused mill, with a small parking area, and a cobbled access track in the centre of the site.

A site location plan (Drawing 17978-HYD-XX-X-DR-GE-0001) is included at Appendix A.

2.3 Site History

The site is shown to have been developed since the earliest available map, dated 1848, with the existing Mill shown from 1891.

Several buildings were constructed, and subsequently demolished within the northern and eastern parts of the site from 1891 to 1938.

The site appears to have remained the same since.

2.4 Geology and Physical Ground Conditions

The physical ground conditions as encountered by Egniol Environmental in December 2020 are summarised in Table 2.1.

Table 2.1: Ground Conditions Encountered

Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)
Surface Cover – Limestone MOT sub-base	GL	0.3	0.3
Surface Cover – Asphalt	GL	0.1	0.1
Made Ground - comprising either granular sandy gravel with cobbles of limestone and brick, or cohesive sandy gravelly clay with brick, ash, sandstone gravel.	GL	0 - 1.30	0 - 1.30
Superficial Clays - comprising soft to firm sand gravelly clay with low coble content. Gravel and cobbles consist of mudstone and sandstone.	0.75 - 1.8	>1.8 - 2.7	Max 1.75
Superficial Sands - comprising gravelly clayey sand with low cobble content. Gravel and cobbles consist of mudstone and sandstone.	>1.80 - 2.70	> 5.45	Not proven

Detailed descriptions of the encountered ground conditions can be found in Section 3.4.1 of the Phase 2 Investigation report (ref: EEL.7765.R06.001).

2.4.1 Coal mining

The Desk Study report indicates that whilst the site is located with a Coal Mining Reporting Area, the site is not within a Coal Mining development high risk area.

2.5 Hydrogeology and Groundwater

The site does not lie within a Groundwater Source Protection Zone and there are no groundwater abstraction licenses located within 500m of the site.

The Superficial Deposits are classified as a Secondary A Aquifer, with the bedrock Manchester Marls classified as a Secondary B Aquifer.

Groundwater was not encountered during drilling works.

2.6 Hydrology and Flooding

The nearest surface water feature is a culverted unnamed watercourse some 63m northwest of the site.

The desk study information indicates the proposed development is in Flood Zone 1 (with a low probability of flooding from rivers or the sea).

2.7 Waste Management and Hazardous Substances

There is a single historical landfill located 151m northwest of the site, with no further details available.

2.8 Regulatory information

There are very few on-site and nearby industrial processes that may impact the site:

- The desk study report indicate that the use of the site by Vision Site Signs Ltd is a potentially contaminative land use, though no further details are provided.
- A single active Part B authorisation is shown 412m from the site, which is related to unloading of petrol into storage.

2.9 Radon

The site is not in a Radon Affected Area and no radon protection measures are required.

2.10 Visual and Olfactory Evidence of Contamination

No visual/olfactory evidence of contamination was noted during the site investigation works to date.

2.11 Ground Gas

No ground gas monitoring has been undertaken at the site.

3. RISK ASSESSMENT REVIEW

3.1 Introduction

This section summarises the risk assessment findings as presented in the Egniol Phase 2 Investigation report (ref: EEL.7765.R06.001), and is subject to agreement with the regulators.

3.2 Human Health

3.2.1 *Heavy metals, PAHs and TPH*

There were no exceedances of heavy metals, TPH or PAHs in the Made Ground and natural soils tested when compared to the GAC for a residential without plant uptake end-use.

It may be noted that the findings of the pre-demolition investigation will be supplemented by additional investigations to confirm post-demolition site conditions, taking advantage of the newly-exposed areas to expand the SI coverage.

3.2.2 *Asbestos*

During the 2020 investigation no visible Asbestos-Containing Materials (ACM) were observed at the site. However, asbestos fibres in the form of chrysotile were recorded in Made Ground soils in one exploratory hole (WS101 at 0.4m bgl) at a concentration of <0.001% w/w. Further post-demolition delineation was recommended in the ground investigation report.

In assessing the risk associated with this discovery, guidance contained within CIRIA Report C733 was taken into consideration, noting however that there are no UK-based soil guideline values for the assessment of risk from asbestos in soils. Therefore, given the recorded occurrence of asbestos fibres at one location, albeit at a low concentration, the precautionary position is to assume that there may be a risk to construction workers, neighbours, and site end - users from asbestos fibres in existing site materials and mitigation measures are required to ensure that the risk is maintained at acceptably low levels. The proposed mitigation measures are detailed in later sections of this report.

The mitigation strategy with regards to asbestos contamination will be finalised following the completion of the aforementioned supplementary ground investigation. Additional mitigation measures may be required if further discovery of asbestos containing materials occurs.

3.3 Plant Life

No assessment was undertaken with respect to plant life in the 2020 ground investigation report.

Regardless, as there is no subsoil or topsoil growing medium available on the site, this will need to be imported for the areas of soft landscaping.

3.3.1 *Human Health Risk from Ground Gases*

The desk study report indicates a potentially high ground gas risk for the site due to the presence of a historical landfill located some 150m to the north of the site, and a gas risk assessment was recommended to be undertaken as part of the Phase II Site Investigation.

A ground gas risk assessment is understood to be planned for the post-demolition ground investigation, and as such this remediation strategy should be updated once the findings of the risk assessment are known.

3.4 Controlled Waters

No groundwater was encountered during the existing Phase II site investigation and the risk to Controlled Waters was not assessed at the time.

Further site investigation works are understood to be planned for post-demolition which will include a Controlled Waters Risk Assessment, and as such this remediation strategy should be updated once the findings of the risk assessment are known. However, given the findings of the 2020 ground investigation, at this point in time the perceived risk to controlled waters is low.

3.4.1 Water Pipelines

The site is brownfield and there is a presumption in the relevant guidance that barrier pipe may be required. Following completion of the additional ground investigation the appropriate risk assessments will be completed and the requirements with regards to potable water pipes will be agreed with the statutory provider. However, it is unlikely that barrier pipe will be required.

3.5 Summary

The source-pathway-receptor linkages given in Table 3.1 are those which require mitigation based on the findings of the pre-demolition site investigation. A summary of the Source-Pathway-Receptor (S-P-R) contaminant linkages for which the risks may be unacceptable and require mitigation (those that are moderate or higher).

This contaminant linkage table should be updated once the findings of the post-demolition site investigation are known.

Table 3.1: Final conceptual model and residual risks following risk evaluation

Contaminant Linkage				Comments	
Pollutant Linkage	Sources	Pathways	Receptors	General	Mitigation
PL 1.	Loose asbestos fibres in the Made Ground.	Inhalation of fugitive dust.	Human health.	Asbestos fibres measured in Made Ground soil samples, albeit at very low levels.	Mitigation required. Post-demolition site investigation may refine the risk.
PL 2.	Potential contaminants (heavy metals, PAHs, petroleum hydrocarbons) in the Made Ground.	Ingestion, inhalation or direct contact.	Human health.	No exceedances of GACs. However limited site investigation currently undertaken.	Currently no mitigation required. However, a discovery strategy will need to be in place during demolition, earthworks and construction. If encountered, hotspot removal may be required.
PL 3.	TPH and other organic contamination in soils.	Direct contact.	Water supply pipes.	Risk will be assessed as part of post-demolition site investigation	Mitigation may be required subject to findings of post-demolition site investigation

Contaminant Linkage				Comments	
Pollutant Linkage	Sources	Pathways	Receptors	General	Mitigation
PL 4.	Ground gases in nearby historical landfill	Inhalation and explosion	Humans and Neighbours	Risk will be assessed as part of post-demolition site investigation	Mitigation may be required subject to gas risk assessment

4. REMEDIAL STRATEGY

Remediation will be undertaken such that the site is suitable for its proposed new use (residential development with associated infrastructure and areas of soft landscaping). The required standard of remediation will be achieved through a variety of techniques as outlined in the following sections.

The objectives of the remediation works are to:

- break the linkage between any contaminants in the Made Ground and natural soils and future site users (including users of neighbouring properties);
- minimise off-site disposal requirement.

The implementation of the remediation strategy will be in accordance with documented quality assurance procedures to be prepared by the remediation contractor. These will include the following:

- *Detailed Remediation Method Statement (DRMS)* – This document sets out the requirements for gathering data to demonstrate the effectiveness of the remediation in terms of meeting the remediation objectives. These are detailed in the following sections of this report.
- *Verification Report* – A verification report provided by Hydrock will provide a complete record of the remediation activities undertaken at the site and the data collected as part of the verification plan to support compliance with remediation objectives and criteria. It will also include descriptions of the works with associated ‘as built’ drawings and details of any unforeseen conditions encountered during the works and how they were dealt with.

In addition to the above, the contractor (for all phases of works) will be required to secure all necessary permits and licences to allow remediation to be undertaken and prepare appropriate health and safety risk assessments and method statements.

4.1 Summary of Remediation Stages

Based upon the findings of the ground investigation and risk assessment and the Remediation Options Appraisal (presented in Appendix E), the following works will be undertaken to create a site which is suitable for its proposed end use.

It should be noted that if soils are to be reused on site, works will need to be completed in accordance with the ‘CL:AIRE Definition of Waste Development Industry Code of Practice, 2nd Edition’ and the Contractor will need to write an appropriate Material Management Plan and provide a ‘Qualified Person (QP) Declaration’.

The following remedial activities will be required to deliver the site Suitable for Use (SFU) for the defined residential end-use and can be separated into Enablement Phase and Construction Phase.

The remediation works should aim to maximise the reuse of soils on site and minimise off-site disposal, whilst recognising the end goals of the various Specifications.

4.1.1 Pre-works Phase

- Task 1: Project setup and management including liaison with the Local Authority, Environment Agency and Health and Safety Executive, where necessary, with appropriate permits / licences / consents / approvals granted.

- Task 2: Appointment of an appropriate contractor and appropriate permits / licences / consents / approvals.
- Task 3: Pre-works air quality boundary monitoring for dust and asbestos fibres, before demolition and any earthworks commence and during any earthworks.

4.1.2 Enablement Phase

The following works are considered necessary during the Enablement Phase of works:

- Task 4: Demolition, breaking out of hardstanding and below ground obstructions and below slab inspection with discovery strategy.
- Task 5: Post-demolition supplementary ground Investigation
- Task 6: Excavation to required formation level and stockpile testing
- Task 7: Hotspot delineation, assessment and removal of impacted soils (if encountered)
- Task 8: Reuse and placement of soils (Materials management)
- Task 9: Off-site disposal of geotechnically or environmentally unsuitable material
- Validation during Enablement Works and Reporting

It is anticipated the Enablement Phase of work will be undertaken by a single Contractor, referred to as the Enablement Contractor.

4.1.3 Construction Phase

The Construction Phase of works will either be undertaken by a separate Contractor, or the same Enablement Works Contractor. The Contractor shall undertake:

- Task 10: Installation of pipe for potable water supplies (type to be confirmed by the regulator, however it is unlikely that barrier pipe will be required).
- Task 11: Ground gas mitigation (if required).
- Task 12: The installation of a 300mm cover system in soft landscaping areas, comprising a subsoil beneath a topsoil thickness of 150mm.
- Validation during Construction Works.

4.1.4 General Note

All staff for all phases of work, should be made aware of the possible presence of asbestos within the Made Ground soils anywhere on the site at any stage of the development (Demolition, Enablement and Construction).

The Contractors for each stage of works must manage the risks in accordance with their legal requirements and will need to prepare appropriate health and safety documentation and obtain appropriate approvals, licences, consents and permits prior to commencement. In addition, appropriate working methods, monitoring and reassurance testing will need to be undertaken during the works.

All works on site during any phase of work will require the use of suitable air, dust and noise monitoring, personal protective equipment (PPE) and respiratory protective equipment (RPE) as required by current guidance, practice guidance and legislation. Information is provided in Appendix D to assist. However, it should be noted that the guidance provided in Appendix D is considered to be the minimum

standards to be met by the Contractors and it is the Contractors responsibility to ensure works are undertaken in line with the above. Please refer to Appendix D for additional information and general requirements.

All works need to be undertaken in accordance with the Remediation Method Statement (this document) and a Materials Management Plan with a QP Declaration and all remediation works are to be overseen by suitably experienced site staff and a site watching brief or periodic visits will be made by an independent suitably qualified Consultant, to undertake the necessary verification.

5. REMEDIATION STRATEGY IMPLEMENTATION - PRE-DEMOLITION PHASE

5.1 Task 1: Project set-up

Prior to commencement of site activities, detailed planning of the project shall be undertaken including liaison with relevant stakeholders. This report, along with copies of previous environmental reports regarding the Site, should be submitted to the Local Authority and the Environment Agency where required.

The project is to be operated under the Construction, Design and Management (CDM) Regulations, (2015).

5.2 Task 2: Contractor appointment

Under the CDM regulations, the client should appoint a Principal Designer, who would provide the Pre-construction Information Report (PCIR) and it is assumed FJB Construction will be Principal Contractor who must provide a site-specific Construction Phase Health and Safety Plan (CPHASP) prior to works commencing. If the client does not appoint a Principal Designer, they will assume the role.

The Principal Designer will review the CPHASP and notify the local office of the Health and Safety Executive (HSE) of the works prior to commencing (via form F10).

The Principal Contractor must manage the risks in accordance with the requirements outlined in this document and will need to prepare appropriate health and safety documentation and obtain appropriate approvals, licences, consents and permits prior to commencement.

It is the contractor's responsibility to decide, based on the information presented, whether the works required (both demolition and earthworks) are notifiable and/or require the assistance of a 'Licensed Asbestos Removal Contractor' with respect to the Control of Asbestos Regulations (CAR) 2012 and the associated industry guidance, CAR-SOIL™ (Interpretation for Managing and Working with Asbestos in Soils and Construction and Demolition Materials – 2016).

The Principal Contractor will be responsible for implementing any MMP for the site developed by a suitably qualified and experienced consultant.

The Contractors will need to have suitable experience working in a similar setting, with similar ground conditions and with the Contaminants of Concern present at the site.

5.3 Task 3: Air quality boundary monitoring for dust and asbestos fibres

Boundary air quality monitoring will be undertaken before site works commence to establish baseline conditions. This monitoring will continue during enablement works to determine if during the works there is evidence of an increased risk of dust.

Boundary air monitoring results during works shall be compared with acceptable maximum standards set by the HSE.

6. REMEDIAL STRATEGY IMPLEMENTATION - ENABLEMENT PHASE

The Enablement Contractor will undertake the following works:

6.1 Task 4: Demolition, breaking out of hardstanding and below ground obstructions and below slab inspection with discovery strategy.

The enabling works contractor shall demolish, break up and remove below ground structures in accordance with an agreed specification. These include, but are not limited to slabs, pits, drains, hardstanding, foundations, retaining walls, relic structures and service ducts etc.

All broken up materials shall be segregated and stockpiled within the approved working area of the site. Material shall be stockpiled at locations to be agreed with the Client and after submission of the detailed method statements.

The contractor shall inform the consultant after each area is exposed so that they may attend and witness the excavation in accordance with Task 5. The contractor shall survey to Ordnance Survey Grid Reference and Ordnance Datum the base and sides of all excavations and shall provide a composite base of excavation drawing for reference during the works, and as built records.

During the breaking out and excavation of slabs etc. the contractor will undertake additional visual investigation, with any additional plausible source-pathway receptor linkages identified (hotspots/tanks/drainage runs/visible ACM etc) to be added to the remedial requirements.

The contractor shall provide adequate protection against collapse of the excavations and suitable groundwater control measures shall be put in place until the voids are backfilled to a suitable geotechnical specification.

The contractor shall ensure that, where structures or services cross the site boundary and are to remain, the risk of any future contamination entering or leaving the site area through these pathways is negligible. The contractor shall state his methodology for ensuring this requirement.

All unsuitable material is to be stockpiled, tested and removed from site to a suitably licensed facility in accordance with Task 9.

Any areas of unexpected contamination encountered during excavation works should be dealt with in line with the Discovery Strategy at Appendix C and the relevant Task 10 in this RSVP.

6.2 Task 5: Post-demolition supplementary ground investigation

Post demolition, additional investigation is required in order to confirm the ground conditions beneath the building footprints.

6.3 Task 6: Excavation to required formation level and stockpile testing

Soils on site may need to be excavated to reach the required formation level. Excavated materials will be stockpiled and tested to determine their fate (on-site re-use or off-site disposal) in accordance with a Materials Tracking System which the contractor will be required to formulate.

The Principal and Main Contractor will manage the works in accordance with relevant legislation.

Any areas of unexpected contamination encountered during excavation works should be dealt with in line with the Discovery Strategy at Appendix C and the relevant Task 7 in this RSVP.

6.4 Task 7: Hotspot delineation, assessment and removal of impacted soils (if encountered).

Delineation and validation of excavations at the location and in the nearby proximity of any contamination hotspots should be undertaken by an experienced geo-environmental engineer (working on behalf of the contractor or the Client) to inspect for suspect material and oversee effective segregation, stockpiling and validation of soils. In addition, a suitably qualified environmental consultant will undertake a watching brief and the contractor is to inform the consultant prior to hotspot excavation.

Validation of the removal of hotspots would be undertaken by the chemical analysis of samples recovered from the sides and base of hotspot excavations. For large excavations in excess of 100m², a 5m validation grid (on all sides and base) is proposed.

Relevant validation criteria will be developed in the form of Remedial Target Values (RTV's) dependant on the Contaminant of Concern (CoC), though as a minimum the criteria presented in Table 7.1 for import soils can apply.

Removal of impacted soils

Following testing, the impacted soils may need to be disposed of to a licensed waste management facility in accordance with Task 9.

6.5 Task 8: Reuse and placement of soils

Reuse of soils is allowed and will need to be undertaken in accordance with the CL:AIRE 'Development Industry Code of Practice - Definition of Waste' i.e. in accordance with an approved Materials Management Plan (MMP).

If reuse of soils in accordance with an MMP is proposed, segregation and stockpiling of soils will be based on the following suitability criteria:

- Soils potentially suitable for reuse on site as part of the clean cover for landscaped areas (e.g. natural soils), which comply with the requirements of Table 7.1.
- Soils potentially suitable for reuse on site below clean cover for landscaped areas, buildings and hardstanding areas (i.e. soils that fail the cover system criteria in Table 7.1).
- Soils unsuitable for use (e.g. untreated petroleum hydrocarbon hotspots or soils containing gross ACM. These will be disposed of off-site).

Soils that are to be reused on site will be recorded in a MMP and accompanied with supporting excavation and placement logs.

The reuse of soils on site and material management is discussed further in Section 9.

The potential exists that re-use of specific materials (typically demolition waste) may be also be able to be used in accordance with the Environment Agency and WRAP Quality Protocol titled 'Aggregates from Inert Waste'. A U1 waste exemption would also need to be in place prior to any ground works commencing at the site, subject to specific maximum volumes of materials.

6.6 Task 9: Off-site disposal of geotechnically or environmentally unsuitable material

Any material excavated on site may be classified as waste and it is the responsibility of the holders of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way it can cease to be classed as waste for a particular purpose.

Any Made Ground removed from site must be removed to a licensed waste management facility. The waste is to be taken by a registered waste carrier in accordance with applicable Waste Management Regulations.

Waste consignment / transfer notices will be required and are to be retained by the Contractor. Copies of all waste consignment / transfer notices are to be provided for inclusion in the Validation Report.

Any soils deemed hazardous waste for whatever reason will require representative samples to be collected and chemical analysis for Waste Classification and Waste Acceptance Criteria (WAC) testing prior to acceptance of the waste at a licensed hazardous waste landfill.

6.7 Mitigation Measures during Enablement Works

6.7.1 Asbestos

Although not expected, if gross visible Asbestos Containing Materials (ACM) are encountered during the works, the following mitigation measures should be put in place to mitigate the release of airborne fibres during excavation.

With regards to the excavation of soils and as far as reasonably practicable, the removal of gross ACM is required down to and at formation level. It should be noted that:

- In accordance with CAR 2012 (Regulation 16) the Contractor has a duty to 'prevent or reduce the spread of asbestos anywhere where work is being carried out under their control'. Where complete prevention is not reasonably practicable (this would constitute such a case), the regulation requires the Contractor to reduce to the lowest level reasonably practicable the spread/potential for fibre release of asbestos from any place where work under the Contractor control is carried out.
- CAR 2012 notes that the Contractor should select and use work methods that will reduce the disturbance and release of asbestos fragments and fibres to minimise the risk of spread, e.g. by removing items intact or whole and by using dust suppression techniques. ACMs must never be left loose or in a state where they can be trampled on or spread. All asbestos waste should be bagged or wrapped promptly after removal and the waste should be removed from the work area regularly.

Additionally, where enclosures are not used (and this is one of those instances, as it is not reasonably practicable to do so), the Contractors risk assessment should establish what will be required to make sure that, as far as is reasonably practicable:

- the spread of asbestos is prevented (airborne fibres and asbestos in soils);
- people not involved in the work are excluded from the area;
- the work area is totally cleaned after work is completed.

For the proposed activities, there are two activities which could release fibres 1) excavation of soils containing gross ACM and 2) placement of soils containing gross ACM. It reasonably practicable for

visible 'gross'/highly fibrous materials to be handpicked and doubled bagged at the point of excavation. As this material has then been removed, and the potential to liberate fibre on the second activity (placement) has thus been alleviated or reduced to as low a level as reasonably practicable.

As such, in addition to a surface inspection and pick, hand picking of gross ACM is required during excavation and placement activities to ensure that as far as reasonably practicable all visible gross ACM has been removed.

Licensable asbestos lagging has not been detected during the site investigation. However, if during the enablement works it is encountered, all staff undertaking the hand picking must be suitably qualified to handle licenced unbound asbestos. The Contractor is to confirm with Hydrock the qualifications and the suitability of staff prior to commencement. It should be noted that in Hydrock's opinion, Asbestos Awareness is not an appropriate level of competency to pick licenced ACM/asbestos.

The working Detailed Remediation Method Statement (DRMS), including task specific risk assessments and method statements should be prepared by the Contractor and be in place, and risks and required mitigation measures communicated to all relevant personnel prior to the works commencing. Appropriate monitoring, PPE and RPE should be provided and utilised. The working method shall be provided to Hydrock for comment two weeks prior to commencement on site.

Visible fragments of suspected asbestos containing materials on the site surface shall be handpicked. In addition to the controls required under CAR 2012, there may be a requirement to deploy an Environmental Permit. The Contractor is to form their own opinion and either:

- deploy a permit; or
- in accordance with the Environment Agencies 'Remediation Position Statements', dated 7/11/2010, notify the Environment Agency of the activity a minimum of 5 days before start. The EA may then request deployment of a MPP.

All ACM shall be placed in a dedicated covered and lockable skip pending off-site disposal to a suitably licensed facility. Such remediation measures will be undertaken by suitably qualified contractors and in accordance with CAR 2012.

Should further asbestos be identified in the supplementary ground investigation or during the earthworks, air monitoring for asbestos may be required on an ongoing basis during the enablement works (frequency to be set out in the Asbestos Working Plan) and the results shall be compared with acceptable maximum standards set by the HSE. These air monitoring procedures and limits are given in HSG 248 entitled 'Asbestos: The analysts' guide for sampling, analysis and clearance procedures' and CAR 2012. The monitoring should be undertaken by a UKAS accredited laboratory. The limit used is governed by the levels stated in the above guidance documents and the accuracy of the testing used. However, Hydrock recommends using the most stringent limit set by the HSE. Air monitoring results are acceptable only if they fall below this limit and are as low as reasonably practicable. Exposure from work activities involving asbestos must be reduced to as far below the control limit as possible.

6.7.2 *Control of risk from dust emissions*

Dust suppression

To reduce the potential for the generation of dust, it is recommended that double handling of soils is kept to a minimum and if required, soils are disposed of by direct transfer to wagons and measures to minimise dust (e.g. wind or plant / vehicle movements) should be undertaken.

Appropriate risk assessment and mitigation measures should be in place by the contractor throughout the development. As a minimum, this should include damping down of the site surface, excavations and stockpiles to prevent the generation of dust.

6.7.3 *Management of groundwater*

There will be a requirement to appropriately manage any accumulation of groundwater in excavations. The Contractor will be required to make arrangements for the treatment and disposal of accumulated groundwater during excavation works.

If treatment of groundwater is required it is the Contractor's responsibility to obtain all relevant licences and consents.

6.8 *Validation criteria during enablement works*

The following sections detail validation criteria to be used during the enablement works, it should be noted that only hotspots and soils identified during any watching brief that require testing.

6.8.1 *Testing*

All sampling, logging and testing of soils shall be undertaken in accordance with BS 5930:2015+A1:2020 'Code of Practice for Site Investigations' and BS 10175:2011+A2:2017 'Investigation of Potentially Contaminated Sites – Code of Practice'.

The Contractor shall undertake all testing at a laboratory which holds UKAS and MCERTS accreditation for the specific tests. Where it is not possible to obtain the testing of a material for a specific property to a UKAS or MCERTS accredited method, the Contractor shall obtain permission from the Consultant for the test to be completed at the proposed laboratory before the test is undertaken.

The results of all testing undertaken (and a copy of the test certificates), shall be submitted to the Consultant as soon as they are reported, and no more than one day after issue of the test certificate to the Contractor. It is recognised that different tests may take different time to complete. However, the Contractor shall advise the Consultant of any delay that they are aware of regarding the completion of any tests (e.g. a sample is being retested and the report will be delayed). The Consultant shall be given sufficient time to review the content of the testing and the associated test results.

The Contractor is to make available on site at all times a file containing all test certificates in addition to the testing summary, for inspection by the Consultant.

Test results are to be summarised in a single master spreadsheet (which contains all data) and is to be in a format agreed with the Consultant. Data that does not meet the specification shall be highlighted and include details of what works were undertaken to address the non-compliance. The master spreadsheet, results of chemical testing and drawings shall be maintained and kept up to date.

Updated versions of these documents are to be provided to the Consultant by 10:00am every Monday morning throughout the Contract.

6.8.2 *Enablement Contractor's Validation Reports*

The Contractor will provide the following validation reports:

- Materials Management Validation Report;
- Remediation Validation Report.

All reports provided by the Enablement Contractor shall be available in Adobe pdf format which has been digitally bookmarked at each section heading. All chemical data is also required in Excel format.

Materials Management validation report

The Materials Management Validation Report is to document the validation of the approved Materials Management Plan and will include the validation of imported soils, site won soils and placed soils. A separate MMP will be required for the import of subsoil and topsoil for the cover system.

As a minimum the Materials Management Validation Report is to include:

- Details of the import mechanisms for each material source;
- Detailing the testing (chemical and geotechnical) of imported materials to prove each source is suitable for use;
- Detailing the testing (chemical and geotechnical) of site won materials to prove each source is suitable for use;
- Records of material movement, including:
 - a. stockpile inspection records;
 - b. stockpile reuse appraisal record;
 - c. volumes, origin and placement location of soils referenced to field results and inspections;
 - d. details and quantities of excavated, screened, treated, imported and reused soils; and
- Records of earthworks excavations including as built drawings, photographs, quantities of materials and records of progress.

Remediation validation report

The Enablement Contractor will maintain records of the works and a Validation Report shall be prepared by the Enablement Contractor on those aspects of the works it has completed and is responsible for.

The Validation Report will provide a complete record of the remediation activities undertaken at the site and the data collected to support compliance with remediation objectives and criteria. It will also include descriptions of the works with associated 'as built' drawings and details of any unforeseen conditions encountered during the works and how they were dealt with.

This Validation Report shall incorporate a summary of and commentary on:

- Site stripping and clearance activities.
- An outline of the remedial action taken to remove or encapsulate lead impacted soils.
- Results of environmental monitoring (noise/dust).

- Details of retained services and obstructions encountered but not removed.
- Records of excavations, including:
 - a. Ordnance Datum survey of extents and depth;
 - b. Ordnance Datum survey of extents and depth of any residual features;
 - c. record of decisions for over-excavation;
 - d. photographic record of each excavation; and
 - e. records of inspection and final extents of validation.
- Records of laboratory analytical and *in situ* field test results, including:
 - a. laboratory results and location plan for each analytical test;
 - b. field test kit results and particulars of monitoring (e.g. date, location, personnel);
 - c. laboratory measurements of accuracy and precision;
 - d. calibration data for field measurement equipment in accord with manufacturers guidance; and
 - e. Chain of Custody forms.
- Waste classification and management documentation, including:
 - a. copies of all consignment notes, in particular those relating to the hazardous waste regulations; and
 - b. details of waste facilities where materials were disposed of.
- Stockpile plan of all stockpiles generated by the works and remaining on site.
- Copies of chemical testing of the stockpiles.
- Final as-built survey of the as excavated voids.
- Final as-built survey of the site (in AutoCAD format).
- Confirmation that site levels are as required by the structural design and Geotechnical Design Report.

Information associated with regulatory health and safety, control of noise, nuisance, dust, and waste will be excluded from the technical validation reporting and will be submitted as separate documentation. This separation is made to differentiate between technical remediation requirements stated herein and operational controls of work.

7. REMEDIAL STRATEGY IMPLEMENTATION - CONSTRUCTION PHASE

The following will be undertaken during the Construction Phase of Works either by the Enablement Contractors or a separate Ground Works Contractor.

7.1 Task 10: Installation of pipework

If, following the additional works, risk assessment and correspondence with the water supply company, barrier pipe is required then this will need to be validated.

Validation is to be completed by the Contractor by the provision of delivery tickets showing Protectaline (or similar) has been delivered to site and photographic proof provided by the Contractor to the Client and the Consultant that Protectaline pipework or similar has been installed.

7.2 Task 11: Ground Gas Protection Measures (if required)

The desk study report indicated a potential high risk for ground gas at the site, which has not yet been assessed. The post-demolition site investigation will assess the risk posed from ground gases. The ground gas risk assessment indicates mitigation is required, then mitigation measures shall be undertaken in line with BS8485:2015+A1:2019, and validated in accordance with CIRICA C735.

This section of the RMS will be updated upon completion of the ground gas risk assessment.

7.3 Task 12: Installation of a simple cover system

If following the enablement phase of the earthworks, Made Ground remains in areas of proposed soft landscaping, a cover system will be required to break the pathway between the soils and end users. If this is the case, the installation of a 300mm cover system is required and the formation level should be set at the appropriate levels to incorporate this below the finished levels.

Should natural soils be present at the formation level, a cover system will not be required, this would have to be inspected by a suitably qualified Geo-environmental engineer.

Where the contaminated soils underlie buildings or other areas of hardstanding a cover system will not be required as the presence of the hardstanding will prevent the site users from coming into contact with the contaminated soils, breaking the pollutant linkage.

With reference to BRE document reference 465, 'Cover Systems for Land Regeneration, Thickness of Cover Systems for Contaminated Land', and the presence of asbestos fibres in the soils (albeit at <0.001% w/w), the installation of a cover system is proposed to comprise (in order of placement):

- 300mm of Subsoil and/or Topsoil (minimum 150mm Topsoil).

For areas of proposed trees, tree pits will need to be excavated and additional Subsoil placed.

The cover system will be installed by the Contractor and verified by an independent suitably qualified Consultant.

Further discussion with regards to the justification of the cover system is provided in Appendix E.

The cover system installation should be undertaken in the following steps:

1. Establish the finished ground levels over the site and from this determine the required level of the underside of the cover system.
2. In areas where trees are planned as part of the landscaping the cover system should be increased to allow for the root ball. The dimensions of the tree pit (if required) are to be specified by a qualified arboriculturist in conjunction with the landscape architect.
3. Install drainage and other services, over-excavating and replacing the soil in service runs where applicable.
4. Check the level of the ground surface to ensure that it is at the correct level for the underside of the cover system.
5. Any imported or site won subsoil and imported Topsoil should be stored on site in stockpiles on a geotextile break layer.
6. Place the 300mm (minimum) of Subsoil and/or Topsoil, (of which a minimum 150 mm is to be Topsoil) and verify the thickness (independent consultant to be called to validate – minimum 48-hour notice).

All soils moved and placed as a cover system need to be transported and stored with care to prevent cross contamination. This will include (but not be limited to):

- the stockpiling of soils on a geotextile separator layer;
- using dedicated plant to move the cover system soils, or washing plant thoroughly before use to move cover system soils;
- minimising tracking over contaminated soils;
- separating clean and dirty areas of the site; and
- placing the soils into the final position and not pushing soils across the surface.

In order to ensure compliance with any proposed MMP it is necessary for imported material to achieve both the physical and chemical properties stipulated in Sections 7.3.3 and 7.3.4.

7.3.1 *Sourcing of Material*

The criteria for site won material (Subsoil) and imported Subsoil and Topsoil is detailed in Sections 7.3.3 and 7.3.4. Any imported soils should be from a natural source not expected to be contaminated.

Prior to importation of Topsoil or Subsoil from a commercial supplier, certification should be obtained from the supplier detailing the source site, its previous and current land use and relevant test results. A copy of this should be forwarded to the independent Consultant for review and comparison against the import criteria.

If the proposed source is not from a commercial supplier, Hydrock recommend that the source is tested prior to import to confirm it is appropriate for use within the cover system. Material which is imported and subsequently found to fail the criteria will need to be removed from site to an appropriate facility with all costs borne by the contractor.

Following import to site (regardless of the source), chemical testing of the imported soils will be required to confirm the soils imported are the same as those sampled at the donor site. See Section 7.3.4 for quantities of testing and testing schedules.

7.3.2 *Stockpiling of Materials for the Cover System*

On importation of Topsoil, Subsoil and other materials, the materials should be stockpiled at a suitable location on site. Copies of the carrier's consignment notes should be retained and a copy forwarded to the independent consultant and be made available on request.

Topsoil and Subsoil should be stockpiled separately and away from areas designated for storing other materials or potential sources of contamination. Soils should be stockpiled on geotextile separator layers to prevent cross contamination.

Separate stockpiles should also be created for each different source. Topsoil stockpiles to be kept below 2m in height at all times and traffic on the stockpile to be minimised.

All stockpiles should be identified with clear signs and each stockpile of imported material should be given a clear reference number and designated sheet recording the following:

- identification reference (e.g. Stockpile A, B, C etc.);
- material type (e.g. Topsoil);
- source site;
- the carrier's consignment notes reference numbers;
- the approximate volume (number of loads); and
- which area the material is to be used.

Each entry shall be signed and dated by the Site Manager or their Assistant. A template form is provided in Appendix B. Other templates or documentation may be used. These sheets should be available for inspection by the Client, the Consultant, Local Authority staff and others involved with this development. A copy should also be given to the Consultant when verification visits are made.

7.3.3 *Physical Requirements of Cover System Soils*

Imported topsoil should conform to the requirements of BS 3882:2015 (Specification for Topsoil and requirements for use), or as agreed with the Client.

If the Client agrees that Topsoil does not need to conform to BS 3882:2015, it should not comprise chalk, clay and/or sand and should have a maximum of 60% of fragments in excess of 2mm, a maximum of 30% in excess of 20mm and a maximum of 10% in excess of 50mm, with nothing in excess of 75mm. It should be noted that clay soils are not recommended as they are likely to become waterlogged during handling and placement. The imported material is to be confirmed by visual inspection of the material by a suitably qualified Geo-environmental Engineer on behalf of the Consultant and if necessary, by laboratory Particle Size Distribution assessment.

Imported soils should be free of asbestos, metal, plastic, wood, glass, tarmac, brick, paper, concrete or other potentially hazardous foreign material which could cause injury. In addition, all materials must be free from aggressive / invasive weeds (especially Japanese Knotweed and Giant Hogweed) and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems.

7.3.4 *Chemical Requirements of Cover System Soils*

For all imported soils as part of the cover system, certification from the commercial supplier should be reviewed prior to import, or if not a commercial supplier then the soils should be tested at source.

Chemical testing will then be required once the material arrives at site. Testing should be undertaken at a rate of one test per 250m³, with a minimum of four tests per import round. For site won material, this should be tested at a rate of one test per 100m³, with a minimum of four tests per testing round.

Depending on the source or variability of imported material, the Consultant may, at their discretion, request additional testing to be undertaken. If constant sources are used for the Topsoil and Subsoil and the results recorded are consistently acceptable, consideration may be given to reducing the number of samples tested.

The results of chemical testing of all material to be used in the cover system are to be compared with the cover system criteria presented in Table 7.1, and if Total TPH exceeds 100mg/kg, the criteria for the individual petroleum hydrocarbon fractions. If any of these thresholds are exceeded the material shall be considered to be unsuitable and disposed of off-site.

Testing should be carried out for the following general suite of contaminants and the results compared to Table 7.1:

- As, B (water soluble), Be, Cd, Cr (total), Cr(VI), Cu, Hg, Ni, Pb, S (elemental), Se, V, Zn, cyanide (total), sulphide, pH, asbestos screen, speciated polycyclic aromatic hydrocarbons (PAH, by GC-FID), total phenols and fraction of organic carbon; and
- total TPH.

Table 7.1: Cover System Criteria (Residential without plant uptake)

Proposed RTV mg/kg					
Contaminant	(1% SOM)	Contaminant	(1% SOM)	Contaminant	(1% SOM)
Arsenic	40	Aliphatics EC5-EC6	42	Acenaphthene	10
Beryllium	73	Aliphatics >EC6-EC8	10	Acenaphthylene	10
Boron*	3	Aliphatics >EC8-EC10	27	Anthracene	10
Cadmium	87	Aliphatics >EC10-EC12	48	Benzo(a)anthracene	5.5
Chromium (III) *	400	Aliphatics >EC12-EC16	24	Benzo(a)pyrene	1.5
Chromium (VI)	6.1	Aliphatics >EC16-EC35	100	Benzo(b)fluoranthene	10
Copper*	135	Aliphatics >EC35-EC44	100	Benzo(ghi)perylene	10
Lead	310	Aromatics >EC5-EC7	100	Benzo(k)fluoranthene	10
Mercury, inorganic	240	Aromatics >EC7-EC8	100	Chrysene	10
Nickel*	75	Aromatics >EC8-EC10	47	Dibenz(a,h)anthracene	1.3
Selenium	600	Aromatics >EC10-EC12	100	Fluoranthene	10
Vanadium	1200	Aromatics >EC12-EC16	100	Fluorene	10
Zinc*	300	Aromatics >EC16-EC21	100	Indeno(1,2,3,cd)pyrene	63
Cyanide (free)**	10	Aromatics >EC21-EC35	100	Naphthalene	2.3
Phenol (total)**	10	Aromatics >EC35-EC44	100	Phenanthrene	10
Asbestos	NIL	All >EC44-EC70	100	Pyrene	10
		Total TPH****	100	Total PAH***	50
* Derived from the GAC for plant life (pH 7).					
** capped at 10mg/kg					
*** individual PAH species capped at 10mg/kg, or GAC (whichever is lower)					
**** individual TPH speciated bands capped at 100mg/kg, or GAC (whichever is lower)					

The above is to be confirmed with the EHO.

8. SUPERVISION, VERIFICATION AND REPORTING

Necessary changes to the agreed Implementation Plan, arising during the course of the works, are to be agreed in writing with the Local Authority and Environment Agency prior to being undertaken on site.

It is advised (although not required by the regulators) that details of the environmental works undertaken, the rationale and design for the implementation of this strategy and verification details of the works undertaken are appended to the deeds for the property to ensure the site is sold with full knowledge of the works undertaken and the ground conditions present.

8.1 Site Supervision

Remedial activities relating to hotspot removal and removal of hardstanding etc. will require the site watching brief by an independent Consultant (The Consultant). Following the adequate completion of these activities watching brief visits could be periodic as agreed between the Geo-environmental consultant and contractor to ensure appropriate supervision during pertinent excavation and validation works.

8.2 Collection of Samples

All samples are to be taken in accordance with relevant guidance (e.g. BS 10175). Soils for inorganic analysis will be sealed in air-tight polythene tubs.

Soils for organic analysis will be sealed in amber glass jars with the minimal practicable headspace.

If required, groundwater samples will be collected in suitable containers and with the correct preservatives, as provided by the laboratory.

All samples shall be scheduled on Chain of Custody forms prior to being dispatched to the UKAS accredited laboratory for analysis. All testing will be MCERTS accredited where available.

On completion of the verification works the appropriate verification documentation will be forwarded to the client and the Local Authority.

8.3 Enablement Phase Verification

Upon the provision of a Validation Report from the Enablement Contractor (see Section 6.8.2), to demonstrate that all of the remediation works have been undertaken in accordance with the RSVP, the consultant will provide a Verification Report.

The report will provide a summary of the key elements of work and will be referenced to the agreed redevelopment strategy and planning requirements with supporting information presented within appendices.

This shall be based upon LCRM (Environment Agency, 2019) and will incorporate a summary and commentary of, where applicable:

- background information on the site;
- statutory and regulatory requirements;
- details of the remediation required;
- decision records covering agreements with regulators;

- records of works undertaken and associated validation and monitoring records obtained from the Contractor (specified above e.g. chemical testing data);
- specialist Contractors validation reports for particular elements of work;
- supporting data (e.g. as built drawings);
- final status of remediation and achievement of remedial objectives to satisfy the planning conditions; and
- additional risk assessments/non-scheduled reactive works undertaken.

On completion of the verification works the appropriate documentation will be forwarded to the client and the Local Authority.

8.4 Construction Phase Verification

8.4.1 *Ground Gas and Vapour Protection Measures*

If ground gas protection measures to are required, then verification shall be undertaken in accordance with CIRIA C735.

This section of the report will be updated following the completion of the gas risk assessment.

8.4.2 *Cover system*

Upon completion of the Cover System by the Contractor, verification pits shall be excavated by the consultant in order to measure the thickness of Topsoil and Subsoil.

These pits should be excavated at a rate of one pit per landscaped area, or if a larger area one pit per 625m² (25m x 25m grid).

If the Cover System is deemed to be insufficient, the Site Manager will be informed and advised on how much more material is needed for the Cover System to be adequate. In instances where the Cover System is measured to be inadequate, following the addition of further soil, the verification pits will be re-excavated to confirm that a sufficient thickness of soil is present.

Verification of the Cover System will only be carried out on areas where the Cover System has been completed. On completion of the verification works the appropriate verification documentation, detailing the works that have been completed in accordance with the agreed Implementation Plan, will be forwarded to the Client and the Local Authority.

The cover system verification report will include:

- confirmation of the source of imported material;
- confirmation of the capping thicknesses, including photographs of the verification pits with a scaled marker;
- confirmation of the physical suitability of the material in accordance with Section 9.2.2;
- the chemical test results for the samples taken from the stockpiles of soils and confirmation that the material is visually consistent with that tested, or the chemical test results for samples taken once the capping has been placed; and
- confirmation that the chemical test results pass when compared to the RTVs in Table 7.1 in section 7.3.4.

9. REUSE OF SOILS ON SITE AND MATERIALS MANAGEMENT

9.1 Waste Management Background

The site is a brownfield site; as such any material excavated on site will be classified as waste as soon as it is excavated unless there is a clear plan in place for the reuse of soils at the site.

One of the ways this can be achieved is set out in the Contaminated Land: Applications in Real Environments (CL:AIRE) document: 'The Definition of Waste: Development Industry Code of Practice' (Version 2) (CoP), dated March 2011.

The handling, reuse or disposal of waste is regulated by the Environment Agency (EA). The EA will take into account the use of the CoP in deciding whether to regulate materials as waste.

If materials are dealt with in accordance with the CoP, the Environment Agency considers that those materials are unlikely to be waste at the point when they are to be used for the purpose of land development. This is because the materials were never discarded in the first place, or because they have been submitted to a recovery operation and have been completely recovered so that they have ceased to be waste.

The procedures to be followed for the production of the MMP will need to follow the protocols outlined for 'Route A' – Remediation Strategy (as outlined by CL:AIRE) for the reuse of materials on the site of origin (ref CL:AIRE Code of Practice, Appendix 1).

The Enablement Contractor is responsible for writing and ensuring all works are undertaken in accordance with a MMP. The Contractor is responsible for writing and managing, payment for and obtaining qualified person (QP) sign off.

9.2 Material Suitability

9.2.1 Chemical Suitability

The following section is a summary of chemical suitability based on the site investigation works undertaken at the site.

Made Ground

A cover system is required for all landscaped areas where un-remediated Made Ground is present at 300mm below final ground level, a cover system will not be required where natural soils are confirmed at formation level.

Topsoil

There is no topsoil present on site and this will require importation for the Cover System.

Subsoil

Subsoil will be required for the following reasons:

- to backfill voids if there is an insufficient volume of site won material; and
- as Subsoil in the Cover System.

The Made Ground on site is not considered to be suitable for re-use within the simple cover system. if the Natural ground is to be used as subsoil then this should be tested

However, it may be possible to use these soils below the cover system if they are geotechnically suitable.

Granular Soil

Following demolition, screening and processing of the granular Class 1/Class 6F2 graded soils will be processed and stockpiled.

Careful stockpile management will be required to allow reuse of materials at the site. The use of Materials Management Plans should allow the reuse of soils at the site in accordance with the Code of Practice.

Any other materials not suitable for use, or not required during construction, will need to be disposed of to an appropriate waste disposal facility at the cost to the Contractor.

9.2.2 Geotechnical Suitability

The Contractor will be responsible for undertaking any geotechnical testing as required and placing any material to a suitable geotechnical specification which is to be agreed with the Client.

9.3 Certainty of use and Quantity of Material

There will be an opportunity to reuse soils at the site following excavation. Any excess soils will be disposed of at the Contractor's cost.

Materials excavated during the Demolition and Enablement Works will be able to be reused on site as levels and the soil characteristics allow.

Following the Enablement Works the following will be required during the Construction Phase:

- excavation of foundations;
- placement of sub-grade in accordance with the pavement design;
- placement of the engineered cover system where Made Ground remains at formation level.

Materials excavated during the Construction Phase will need to be disposed of off-site.

There will be a requirement for clean Subsoil and Topsoil to be imported for the engineered cover system and clean granular (Type 1, 6F2/6F5) material for pavement construction.

Only materials deemed suitable for use by an appropriately qualified person will be utilised on site. Any out of specification material obtained from the site which is not deemed suitable for use will, if appropriate, be classified as waste and will be disposed of or recovered in the proper manner and in accordance with waste legislation.

Material imported to site will be subject to the necessary testing/review prior to delivery to site to minimise the risk of the importation material unsuitable for the required specification. Any material deemed unsuitable upon arrival at the site will be rejected.

Only sufficient material required on site for the purposes of raising levels in accordance with the pre-determined proposals (planning conditions and drainage strategy) will be imported or reused on site.

Any surplus material or material which does not meet the required specification arising from development will be disposed of off-site. It is the responsibility of the Contractor at each stage of the

works to have checked all volume calculations and have allowed for disposal of unsuitable or excess materials.

Any materials considered suitable for reuse will require confirmatory testing following excavation or processing. Where confirmed following additional testing, these materials are considered suitable for reuse within garden and landscaped areas.

9.4 On Site Materials Management

9.4.1 Stockpiles

Site won material for potential reuse will be stored on site in stockpiles. The stockpiles are to be managed by the Enablement Works and Ground Works Contractor(s) during the relevant phases of work and will be subject to operational constraints at the time of stockpiling.

Stockpile locations will be clearly marked and documented on working drawings maintained in the site office.

The Contractor for each phase of works is to take appropriate mitigation measures and environmental precautions as considered necessary at storage locations. However, as a minimum, stockpiles should be compacted to prevent dust and they should be kept wet in periods of dry weather.

During the remediation works, materials will be excavated and consolidated into designated stockpiles, with the different soil types stockpiled in different clearly marked stockpiles. A record of the excavated quantities and reuse locations will also be maintained on site. An example tracking system and example forms are provided at Appendix B. A copy of all tracking forms and delivery tickets used for transportation of soils to site will be held at the site office.

9.4.2 Confirmatory Chemical Testing

Material for On Site Reuse – Excavated Material

If soils are proposed for reuse within the cover system, they will be sampled at the rate set out in 7.2 and test results compared to the cover system criteria in Table 7.1

Materials found to be out of specification are to remain on site in segregated stockpiles until such time that they can be disposed to a suitably licenced waste disposal facility.

At each phase of works a record should be maintained by the Contractor of the movement of the stockpiled material and the area within the excavation into which it is placed.

Material for Off-Site Disposal

Any material requiring disposal (during any phase of works) shall be disposed of in accordance with Section 6.6. It is the responsibility of the Contractor to ensure adequate and appropriate disposal, including testing to satisfy the proposed waste facility.

Records of the removal of stockpiles off site should be maintained by the Contractor including details of the disposal or treatment site to which they have been taken. These details are to be passed to Hydrock to form part of the verification report.

Appropriate precautions should be taken by the Contractor to ensure that the stockpiled material does not result in risks to neighbouring land users.

Imported Material

Imported soil will be tested to determine it is suitable for use.

The Contractor importing the material is to provide laboratory analysis to the consultant to prove the suitability of the material to be brought on to site in line with the requirements specified in Section 7.3.1.

Once the soils are present on site, additional testing will be undertaken in accordance with Sections 7.3.3 and 7.3.4

For granular soils (Type 1/6F5/6F2 etc.), which are to be used as part of pavement or road construction, Hydrock propose the following guidelines:

- no visual contamination (oil staining, asphalt, etc.) as confirmed by independent consultants watching brief;
- limited deleterious material (organics, wood, metal etc.);
- no visible asbestos containing material (ACM) as confirmed by independent consultants watching brief; and
- asbestos – <0.001% (unless otherwise agreed with the LPA and the NHBC).

10. CONTINGENCY PLAN AND AREAS OF UNEXPECTED CONTAMINATION

There is potential for areas of unexpected contamination to be present, due to the former use of the site. Any significant quantities of suspected oily or odorous material, significant ashy soils and unusual brightly coloured or asbestos containing materials should be considered as possibly contaminated.

The Discovery Strategy, included in Appendix C, must remain on site at all times during the Enablement and Groundworks Phases of works. This demonstrates a clear allocation of responsibility for reporting and dealing with contamination.

A copy of the Discovery Strategy must be placed on the Health & Safety Notice Board and/or displayed in a prominent area where all site staff are able to take note of and consult the document at any time. Any member of the workforce entering the site to undertake any excavation must be made aware of the potential to discover contamination and the requirement to follow the Discovery Strategy.

A report should be prepared by the independent consultant and submitted to the regulatory parties, the Local Authority and the NHBC and the Environment Agency where groundwater may potentially have been impacted.

As it is proposed to excavate, screen, sort and where appropriate reuse the soils on site during a separate enablement phase of works, the Discovery strategy will be less relevant to the Construction Phase of works but will still apply.

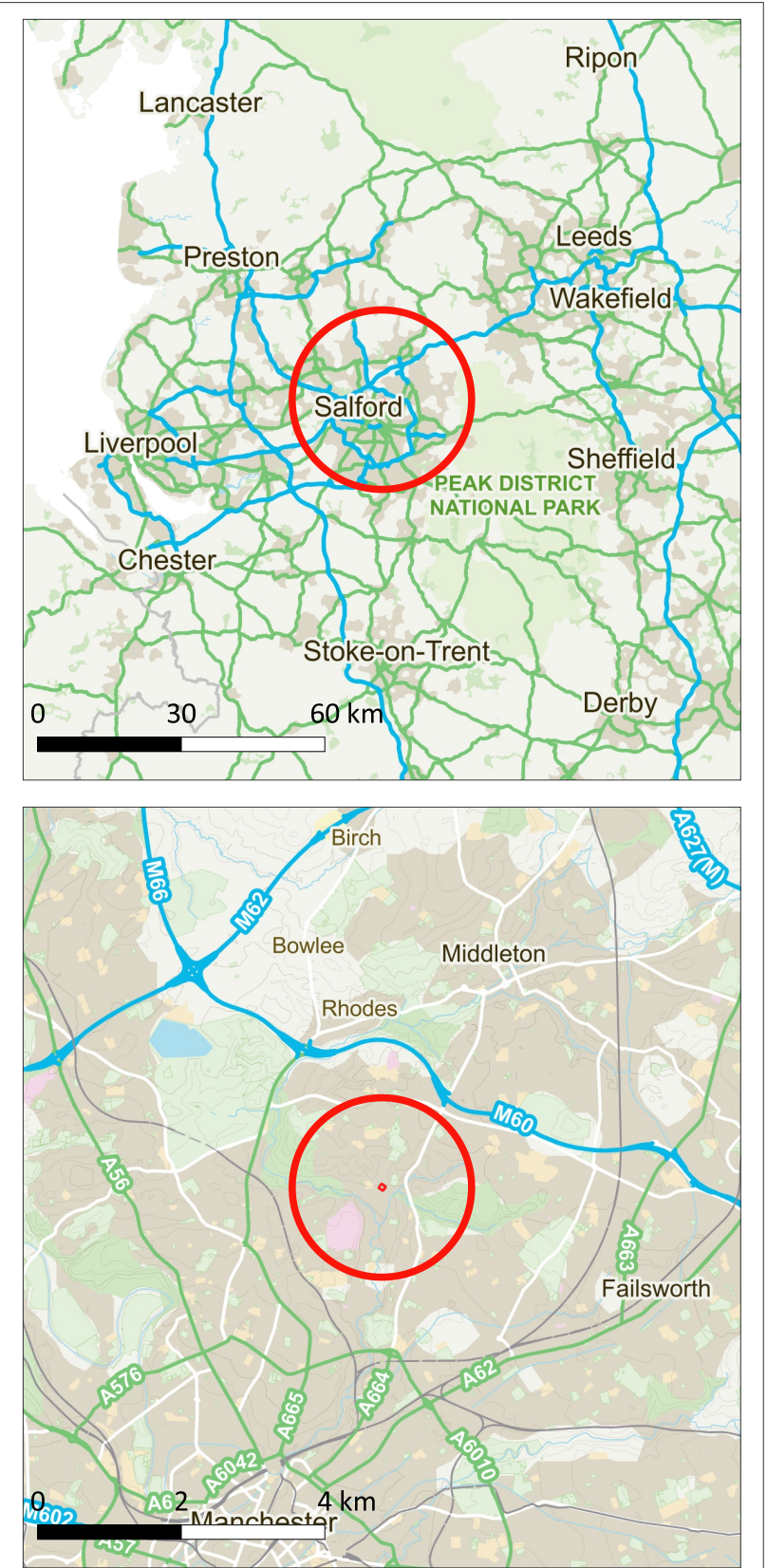
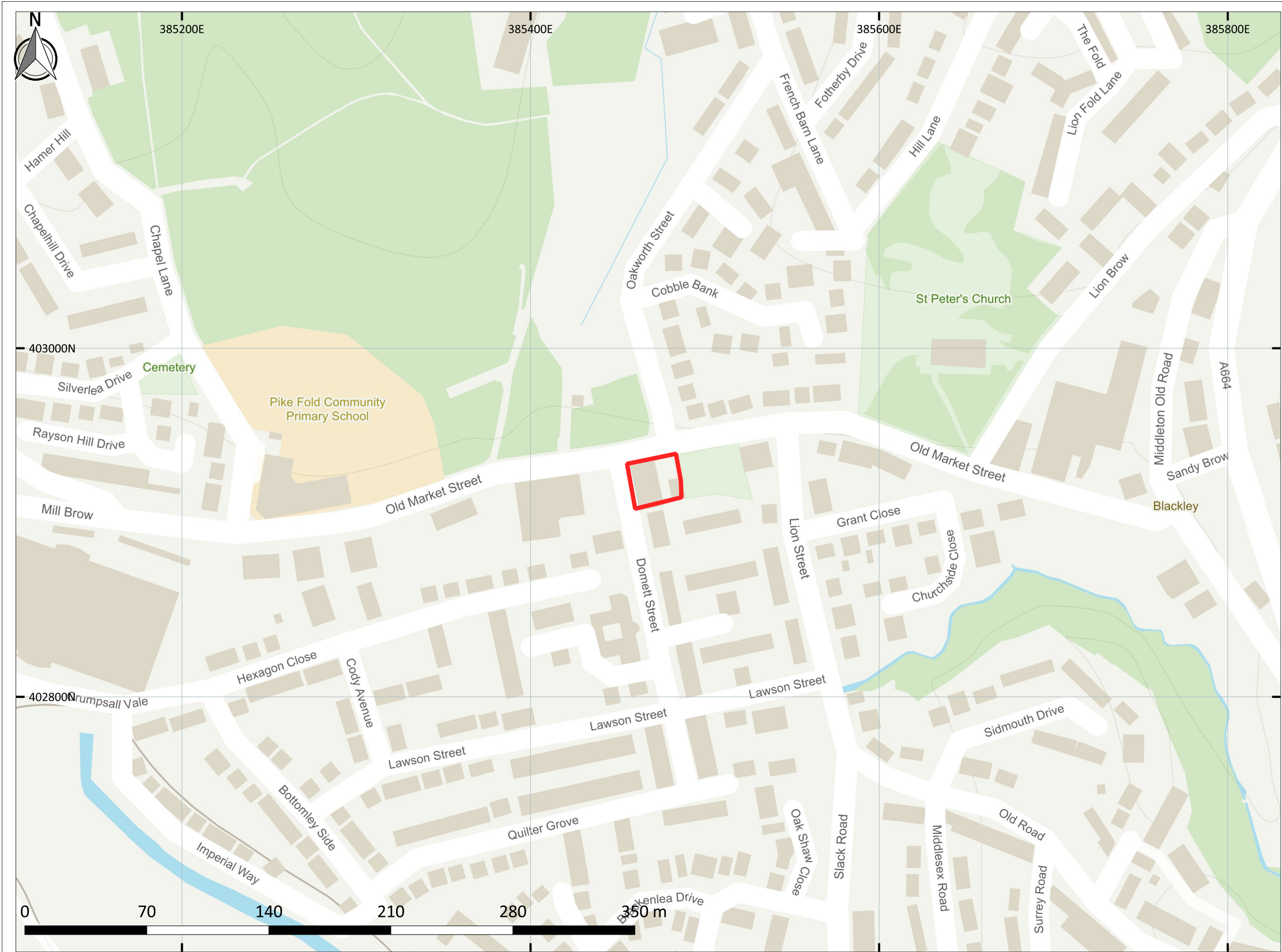
If additional materials are identified these materials will be subject to the procedures stated in this RSVP.

11. REFERENCES

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- ENVIRONMENT AGENCY. 2019. Land contamination: risk management.
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- RUDLAND, D. J., LANCEFIELD, R. M. and MAYELL, P. N. 2001. Contaminated land risk assessment. A guide to good practice. CIRIA Report C552. CIRIA, London. 158 pp.
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Appendix A

Drawings

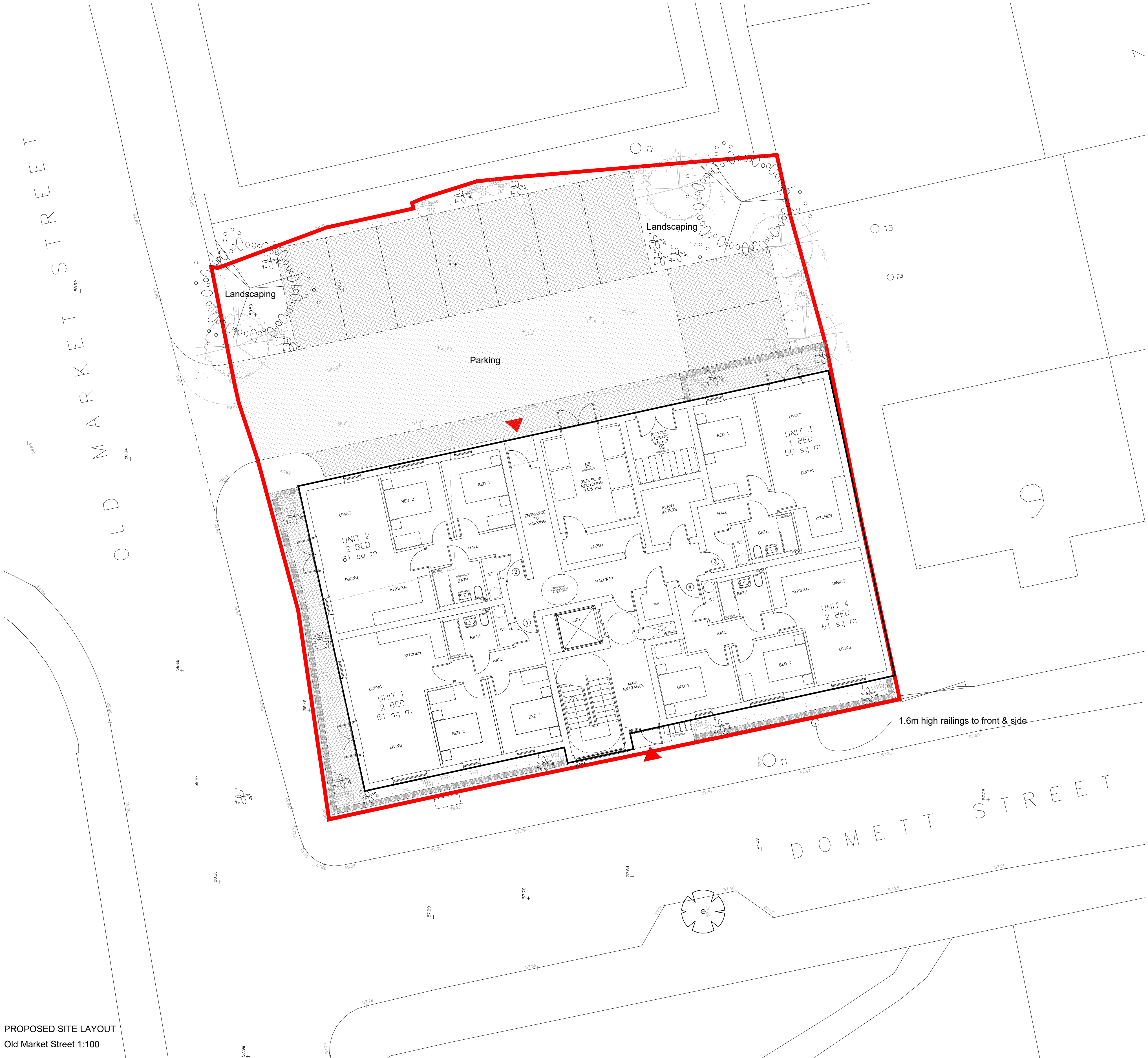


KEY PLAN Site Boundary	NOTES 1. Contains OS data © Crown copyright and database right (2021)	REVISIONS <table><tr><th>REV.</th><th>DRAWN BY INITIALS</th><th>CHECKED BY INITIALS</th><th>DATE</th><th>REVISION NOTES/COMMENTS</th></tr><tr><td>P01</td><td>LW</td><td>DH</td><td>15/03/21</td><td>First issue</td></tr></table>				REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS	P01	LW	DH	15/03/21	First issue	Hydrock		TITLE SITE LOCATION PLAN	
		REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS													
		P01	LW	DH	15/03/21	First issue													
		HYDROCK PROJECT NO. 17978		SCALE @ A3 1:2,500															
CLIENT FJB Construction Limited		PURPOSE OF ISSUE SUITABLE FOR INFORMATION		STATUS S2															
		PROJECT 67 Old Market Street		DRAWING NO. 17978-HYD-XX-XX-DR-GE-0001		REVISION P01													

FOR PLANNING

NOTES

This drawing to be read in accordance with the specification/Bills of Quantities and related drawings.
No Dimensions to be scaled from this drawing. All stated dimensions to be verified on site and the Designer notified of any discrepancies.



Key

- Proposed House Position**
See architects details
- Existing Buildings**
- Existing / Proposed Levels**
E +211.50
P +208.50
- Proposed Drive**
Resin bounded gravel finish with gritstone edge 100 x 100mm unit with 70mm upstand
- Proposed Natural Stone Paths**
With Indian stone sett edge to grass and granite sett edge with upstand to shrub borders
- Existing Timber Fence**
2m high vertical board timber fence.
- Proposed Wrought Iron Railings**
Addition of 1.6m high wrought iron railings to active elevations
- Proposed Side Gates**
- Proposed Garden and Hedgerow Trees**
Typical species to include:
Bp - Betula pendula, 18-20cm girth, RB
Cm - Crataegus monogyna, 18-20cm girth, RB
Ia - Ilex aquifolium - 1.5-1.8m high, RB
Md - Malus domestica 'Cox's Orange Pippin', 16-18cm girth, RB
Mf - Malus floribunda 16-18cm girth, RB
Or - Quercus robur, 18-20cm girth, RB
Pa - Prunus avium 'Plena', 18-20cm girth, RB
Sa - Sorbus aucuparia, 18-20cm girth, RB
- Proposed Area to be Turfed**
- Proposed ornamental shrubs, groundcover and climbers to beds**
Mix of evergreen and deciduous ornamental shrubs, herbaceous planting, groundcover and climbers - see schedule for typical species.

FOR PLANNING

Project
67 OLD MARKET STREET
BLACKLEY
MANCHESTER
M9 8DX

Title
INDICATIVE LANDSCAPE STRATEGY

Scale RTD @ A1	Date FEBRUARY 2020
Drawn SB	Checked -
Drawing Number 6479_L01	Revision -

SMASHBOX

97 ALDERLEY ROAD | WILMSLOW | CHESHIRE | SK9 1PT
T. 01625 466 557 E. hello@smashboxarchitecture.com
www.smashboxarchitecture.com

PROPOSED SITE LAYOUT
Old Market Street 1:100

Appendix B

Form Templates

Imported Soil Documentation Form

Stockpile Identification Reference	
Material Type	
Source Site	
Consignment Note Reference Numbers	
Volume of Stockpile (or number of loads)	
Plots Material to be used in	
Stockpile Identification Reference	

Sketch Plan of Stockpile Location and Sample Points

Signed _____

Position _____

Date _____

Appendix C

Discovery Strategy

DISCOVERY STRATEGY

DISPLAY AND AWARENESS

The Discovery Strategy must be placed on the Health & Safety Notice Board and/or displayed in a prominent area where all site staff are able to consult the document at any time.

Any member of the workforce entering the site to undertake any excavation must be made aware of the potential to discover contamination and the discovery strategy.

HOW TO IDENTIFY POTENTIAL CONTAMINATED MATERIAL

- Looks oily and has an oily odour.
- Solvent type of odour.
- Man-made materials in fill such as paint cans, car parts, glass fragments.
- Contains fragments of white asbestos sheeting, coal/coke clinker.
- Sand bags, and or/subsurface concrete structures.
- Unusual colour e.g. Blue, red or green.
- Asbestos cement/lagging.

(Examples only – This list is not exhaustive. If in any doubt ask the Site Manager)

PROCEDURE

If unexpected evidence of contamination is found the following procedures shall be adhered, including:

1. All site works at the position of the suspected contamination should stop.
2. Site Personnel to inform the Site Manager/Agent.
3. Visual and olfactory observations of the condition of the ground and the extent of contamination should be made and notification shall be given to Hydrock Consultants, who will inform the Local Authority as soon as possible after discovery. Should the contamination be likely to affect controlled waters the Environment Agency shall also be informed.
4. In the presence of a suitably qualified geo-environmental engineer on behalf of the Consultant, investigation works shall commence to recover samples for testing and, using visual and olfactory observations of the condition of the ground, delineate the area over which contaminated materials are present.
5. Should Hydrock deem it appropriate, the affected material may be excavated and placed in a stockpile on a suitable impermeable surface. This should be suitably quarantined with no addition to, or removal of, the stockpile while chemical analysis is being undertaken. Alternatively, the material should remain in situ until laboratory test results have been obtained.
6. A photographic record should also be made of relevant observations.
7. Hydrock will determine an appropriate testing suite based on visual and olfactory observations.
8. Test results will be compared against current assessment criteria suitable for the future use of the area of the site affected.

9. If after testing the ground is found to be contaminated, the Local Authority and NHBC shall be informed. After consultation with the Local Authority, NHBC and if necessary the Environment Agency, materials should either be removed for disposal to a licensed waste management facility or remediated to agreed clean-up criteria.
10. If the evidence for contamination is severe, as if it leads to pollution of water courses, the Environment Agency shall be informed immediately as an environmental incident (see EA website).

UNEXPECTED TANKS

It is possible that underground tanks, which have not been identified by the investigations to date, may be present. The following procedures are to be adhered to if tanks are identified:

11. All site works at the position of the tanks should stop.
12. A description of the tank should be made by Hydrock including; condition and surround, along with visual and olfactory observations should any contents in the tank be apparent. A photographic record should also be made of relevant observations.
13. The tank's position and depth should be determined and marked on a plan of the site.
14. Notification shall be given to Hydrock Consultants who will inform the Local Authority within 24 hours.
15. During the presence of a suitably qualified geo-environmental engineer on behalf of the Consultant, investigation works should be undertaken to obtain samples of any liquid or sludge contents and to establish dimensions of the tank.
16. Laboratory testing will be determined by Hydrock Consultants based on visual and olfactory observations of the material.
17. Test results will be compared against current assessment criteria and proposals for disposal of any contents determined in agreement with the appropriate Regulatory Parties.
18. Emptying the tank and disposal of contents to a suitable licenced disposal facility.
19. Once the tank has been emptied in accordance with the above proposals, it is to be removed for disposal to a licensed waste management facility. Copies of the relevant waste consignment notes are to be forwarded to Hydrock Consultants.
20. Excavation and remediation of any contaminated soils in accordance with Section 6.4.
21. Samples of the base and sides of the resultant hole will be sampled as per the Consultant's instructions and an assessment as to whether this may have been a source for groundwater contamination made.

A report will be prepared by Hydrock and submitted to the regulatory parties, the Local Authority and the Environment Agency where groundwater may potentially have been impacted.

Appendix D

Contractor Requirements

Compliance with Legislation and Standards

The works are to be undertaken in compliance with all relevant British Standards, codes of practice, regulations, guidance and legislation.

Whilst not an exhaustive list, works shall be in compliance with the latest revision of all relevant legislation, HSE Guidelines and good working practice including, but not be limited to, the following:

- The Health and Safety at Work etc. Act 1974;
- Construction Health Safety and Welfare Regulations 1996;
- Health and Safety Executive 'Protection of Workers and the General Public during Redevelopment of Contaminated Land' HS (G) 66, HMSO 1991;
- The Construction, Design and Management Regulations 2015;
- The Control of Substances Hazardous to Health Regulations 2002 (COSHH Regulations);
- The Control of Asbestos Regulations, 2012; and
- BS6187:2011 'Code of Practice for Full and Partial Demolition'.

The Contractor is responsible for obtaining all necessary approvals, licences, consents and permits from regulatory bodies and third parties prior to commencement.

Licences, Permits and Consents

Any conditions associated planning permission should be addressed prior to carrying out the works.

It will be a requirement of the Contractor to obtain any of the necessary permits and undertake the appropriate notifications and assessments. The Contractor should only expect approvals have been sought by others where explicitly provided to the Contractor or advised in writing by the Client or Hydrock.

If treatment of the soils is to be undertaken (e.g. bioremediation of unexpected contamination), it will need to be undertaken in accordance with an appropriate Environmental Permit.

Any reuse of soils will need to be undertaken in accordance with the "Definition of Waste: Development Industry Code of Practice - Definition of Waste. Development Industry Code of Practice", Version 2 2011 i.e. in accordance with an approved Materials Management Plan (MMP) and Qualified Person Declaration. The Contractor is responsible for the MMP.

Health and Safety Requirements

The Contractors must manage the risks in accordance with their legal requirements and all works are to be undertaken in compliance with all relevant regulations, guidance and legislation.

A Construction Phase Plan (CPP) will be required to be submitted to the Principal Designer, the Client and the LPA in advance of mobilisation to site.

The CPP will be passed to the Site Manager who will implement all Health and Safety measures on site. The Site Manager will fully induct the Site Operatives prior to commencement of any works. The CPP will be kept as an open document and will be adapted as required to during the project. This will (as a minimum) include:

- welfare arrangements, storage and security;
- air monitoring requirements (and action levels);
- traffic management plan;
- segregation of working areas and site welfare (and decontamination units if required);
- site inductions, daily safety briefings and toolbox talks;
- activity specific risk assessments;
- method statement briefings;
- daily inspection records; and
- permits to work.

During the works it will be necessary to protect the health and safety of the site personnel. General guidance on these matters is given in the Health and Safety Executive (HSE) document 'Protection of Workers and the General Public during the Redevelopment of Contaminated Land' HS (G) 66. In summary, the following measures are suggested to provide a minimum level of protection:

- all ground workers should be issued with protective clothing (including high visibility clothing), hard hats, footwear and gloves, personnel instructed as to how it should be used;
- all personnel shall wear hard hats, high visibility clothing and protective footwear at all times;
- ensure that everyone on site complies with the health and safety plan;
- take reasonable steps to ensure that only authorised persons are allowed on site (or part thereof as the case may be);
- display, where they can be easily read, any notification that has been sent to the Health and Safety Executive;
- hand washing and boot cleaning facilities shall be provided;
- no smoking except in designated areas;
- good practices relating to personal hygiene shall be adopted;
- prepare method statements for construction operations as required by the CDM Co-ordinator; and
- provide the Principal Designer with any other relevant information.

Before site operations are commenced, the necessary COSHH Assessments, Method Statements and Health and Safety Plans should be completed, approved to the Principal Designer's satisfaction and issued in accordance with the CDM Regulations.

The Health and Safety Plan should pay particular attention to the following hazards which may be encountered:

- potentially hazardous or contaminated materials used or encountered on site;
- deep excavations;
- the potential for ground gases and risks on confined spaced entry;
- working in the vicinity of existing underground or overhead services;
- working in confined spaces;

- working on, or in the vicinity of highways;
- working with materials which have the potential to contain asbestos and the risk of inhalation of asbestos fibres;
- manual handling;
- the potential for fire;
- working with electrical apparatus in the vicinity of mobile plant and the potential presence of water;
- poor lighting;
- the potential for falling/slipping/tripping and sustaining injury;
- the possibility for biological agents to be present, including, but not limited to: psittacosis, leptospirosis (Weill's disease), tetanus, legionella, human waste; and
- working in the vicinity of voids and openings.

The Contractor shall take all necessary safety precautions throughout the ground treatment operations and shall comply with the Health and Safety at Work Act 1974 or any subsequent re-enactment thereof.

The Contractor shall submit for approval all necessary method statements to the Client and the Consultant prior to commencing the works.

The Contractor shall provide details of emergency procedures. Emergency services shall be informed of the site operations prior to commencement.

All statutory records to be kept in the site manager's office and these may include (not an exhaustive list and note not all may be required):

- ASB>NNLW1 – Notification of non-licensed asbestos work if the work is deemed not be requiring a licence;
- appropriate licence with regards to CAR 1012 if the work is deemed to require a licence;
- HSE Notification F10;
- Pre-construction Information Pack;
- Construction Phase Health and Safety Plan;
- Method Statements and Risk Assessments;
- Environmental Permit deployment form and associated paperwork;
- Discharge Consents for disposal of groundwater;
- competence records (including asbestos awareness training and face-fit test records
- service records;
- plant and machinery maintenance records;
- Duty of Care paperwork.

In addition, if asbestos is found during the demolition works/enablement works, it is recommended that:

- Asbestos Awareness training / briefing to be given to all staff;

- background and ongoing air dust monitoring (to include asbestos) to be undertaken to check for presence of asbestos fibres during the works; and
- licensed asbestos contractors are employed to manage the licensed asbestos controlled areas, all other operatives involved in the operations must have appropriate training to satisfy the requirements of the Control of Asbestos Regulations 2012.

Site Establishment and Security

Prior to the commencement of any works, the Contractor, in conjunction with the Client, shall establish the boundaries of the site and working areas.

The Contractor shall make adequate provision to secure the site boundary and prevent unauthorised access onto the site during the course of the works.

Prior to the commencement of any works, the Contractor, shall undertake a dilapidation survey of all adjacent features/construction including but not limited to boundary walls/ fences, adjacent footpath and road constructions etc. The survey is to be agreed with the Client or their representative prior to commencing any work on site.

The Contractor shall be responsible for all costs associated with rectification of damage to adjacent features/construction including but not limited to boundary walls/ fences, adjacent footpath and road constructions etc. resulting from the demolition works. If damage is not noted on the dilapidation survey (or the dilapidation survey is not undertaken) and damage is later reported, it is the responsibility of the Contractor to rectify.

The Contractor is to provide surveying capability as set out in this document facilitate the above.

Prior to the completion of the works the Contractor is to discuss the continuation of the site security, including the fences, with the client and acceptable arrangements for continued security are to be agreed prior to the removal of the Contractor's security provision.

Traffic Safety and Management

The Contractor shall comply in all respects with Chapter 8 of the Traffic Signs Manual for works on or affected the public highway and/or private roads forming the highway access to/from the site. The Enabling Works Contractor shall obtain all necessary consents from the Local Highway Authority for works on the public highway.

On-site access and haul routes should be provided and maintained by the Contractor in such a manner so as not to endanger either the user, those working in the vicinity of such accesses/haul routes and or the Works.

Access to the site will be agreed with the Client prior to commencement.

Suitable precautions shall be taken to prevent the spread of mud and debris on the public highways. Regular inspections of the public highway adjacent to the site shall be carried out. If deemed necessary by the Contractor, the Client or the Consultant, the highway shall be swept regularly to remove any mud, slurry or dust deposited by vehicles entering or departing the site. If the Consultant considers that significant amounts of any detritus have been deposited on the public highway then operations shall be temporarily suspended until appropriate cleaning operations have been undertaken.

The Contractor is to co-operate with other contractors if they are present during the works.

The proposed works will generate a number of vehicle movements associated with the removal of soils and delivery to site of materials. Consideration should be given to the route and the timing of these vehicle movements, to minimise risk and disturbance to sensitive locations (such as schools, residential areas).

Risks associated with the transport of soils that are potentially containing contaminated, such as dust emission, should be appropriately managed by the Contractor.

Welfare Facilities

Site cabins and welfare facilities will be established at a location to be agreed with the Client.

The Contractor is deemed to have made provision and arrangements for all temporary services associated with the welfare facilities.

Working Hours

Noisy operations i.e. the use of hydraulic breakers shall be restricted to operating times as specified by the Client and by the planning permission. It is understood that these are 8:30 am to 5:30 pm, or other hours agreed with the Local Authority, Monday to Friday and 9.00 am to 1.0 pm on Saturday. No working shall take place on Sunday or Bank Holidays.

Prior to commencement the Contractor is to make contact with the Local Authority to establish if any further restrictions apply.

Mobile Plant

Mobiles plant shall be operated by suitably trained and qualified operators experienced for each item of plant. When not in use all plant shall be locked to prevent all plant shall be locked to prevent unauthorised operation.

All traffic entering or working on site shall obey a maximum 10 mph speed limit.

Fuelling of any plant shall be undertaken in a designated area and all above ground fuel storage tanks shall comply with the requirements of the Pollution Prevention Guidelines PPG2.

Specifically, any storage tanks used should:

- be sited within an oil-tight secondary containment system such as an impermeable bund;
- the secondary containment must provide storage for at least 110% of the tanks maximum capacity;
- be located within a secure area; and
- all taps and valves should be fitted with a lock and kept locked shut when not in use.

Maintenance of mobile plant should be undertaken in a designated area, unless absolutely necessary.

Waste oil, hydraulic fluid etc. should not be tipped directly or discharged on to site. Such materials shall be stored separately, in a secure bunded area, for off-site disposal. Waste oil may be a special waste and disposal shall be undertaken by a registered carrier in accordance with the Duty of Care Regulations.

A spill kit shall be kept on site in an accessible place adjacent to the designated refuelling area and used in the event of a spillage or leak.

Surveying

The Contractor shall provide full time surveying personnel and equipment to undertake the following activities and any other requirement for topographical information relating to the project that arises through the duration of the enabling works contract. The survey personnel and equipment should be capable of providing accurate levels and co-ordinates in relation to the national grid and topographical survey provided within 1 day of request.

The following key activities are covered by the requirements for surveying:

- confirmation of topographical survey on possession of the site, and setting out of the site boundary;
- confirmation of positions of existing services and site features;
- surveying the base and extent of all excavations and remaining obstructions (to be undertaken prior to backfilling);
- all setting out and levelling relating to delivery of the enabling works;
- the location of sub-structures removed;
- interim surveys to be undertaken during the infilling works to provide information on issues such as depth of excavation, progress of earthwork, quantities of materials etc.;
- the location and elevation of test samples and locations; and
- as built survey information.

A topographical survey of the site is provided in the Site Information. The Contractor is required to undertake all necessary topographical survey works to verify these levels before the commencement of the contract. Should the Contractor find any discrepancies on the drawings they are to refer the matter to the Client for verification before proceeding with the part of the works affected.

The Contractor shall undertake a topographical survey following completion of the enablement works.

All topographical surveys shall include levels at maximum 10m spacing and details of any features, changes in slope, structures, services and any other features of interest.

All of the above features shall be surveyed for line and level at the site boundary and marked on a plan. Levels shall be to Ordnance Datum and locations to National Grid. The survey shall be calibrated against existing site surveys and benchmarks in the vicinity of the site.

Testing

The Contractor shall be responsible for undertaking all testing necessary to satisfy the Consultant that the works have been carried out in accordance with and comply with the specification.

All soils and chemical testing shall be carried out by a UKAS and MCERTS accredited laboratory, with accreditation for the specific analysis, to the approval of the Consultant. The lowest level of detection shall be used for all testing. The Contractor is to submit to the Consultant the proposed levels of detection for all proposed testing.

The Contractor is to make available on site at all times a file containing all test data received for inspection by the Client or Consultant or Named Representative (NR). The Contractor is to prepare a summary table for presentation with the contractors report detailing test results and associated status.

This summary table will be in Excel format and be updated and sent to the Consultant by 10:00am every Monday. This summary will include an up to date location plan, all samples taken, tests scheduled, laboratory results received and outstanding testing.

Offsite Disposal

Materials for offsite disposal shall be sampled and analysed, by the Contractor, at rates sufficient to allow the material to be adequately categorised.

Material exported from site to landfill, or other appropriately licensed facility, shall be hauled by a registered waste carrier in accordance with the requirements of the Duty of Care Regulations, 1991 and where appropriate the Special Waste Regulations, 1996.

A transfer note shall be completed, signed and retained by all parties involved. The transfer note shall state the volume of waste, the nature of the material and statement to the chemical composition.

The waste transfer notes shall be kept by the Contractor for a period of at least 2 years.

Contamination

Contractors should be made aware of the possibility of encountering contaminants within soils or groundwater at the site (including asbestos) through 'toolbox' talks.

Safe working procedures should be implemented in accordance with CIRIA132 and good standards of personal hygiene should be observed and appropriate levels of PPE provided and utilised.

Eating, drinking and smoking should be strictly prohibited in the development site other than in designated mess areas.

The Control of Noise, Vibration and Dust Nuisance

The Contractor shall comply with the recommendations for practical measures to reduce noise and vibration set out in BS5228-1:2009 and BS5228-2:2009 and with any specific Principal Contractor requirements.

The Contractor shall take all reasonable measures to prevent dust nuisance from being generated by construction traffic, etc.

If necessary, working methods will be altered in order to ensure that the level of noise generated from the works is within published tolerable limits.

The requirements of the LPA are to be sought and undertaken.

General

No fires shall be permitted on site.

Dust Mitigation

Appropriate measures shall be implemented at all times during the demolition and enabling works to minimise any dust emissions.

Any main temporary haul roads shall, where practical to do so, be constructed of crushed hardcore products. The haul roads shall be maintained for the duration of their use to minimise any build-up of loose spoil etc.

Traffic both entering and working on site shall obey a maximum speed limit of 10 mph (unless otherwise agreed).

Mobile water bowsers and sprayers shall be available on site at all times to water unpaved haul roads and working areas. The water spray may include chemical dust suppressants or wetting agents to improve dust control.

Wagons that are to be used for the haulage of any contaminated material from site shall be appropriately sealed or sheeted to prevent the release of fugitive dust.

An adequate supply of water shall be maintained on site at all times to allow for dust suppression activities to be carried out at short notice.

Where mobile water bowsers are no effective in suppressing dust then vapour masts shall be used. Such vapour masts shall be deployed at 20m centres on the downwind side of haul roads or excavations giving rise to significant dust or emissions of odour.

Air quality and dust monitoring stations will be set up and monitored by the Contractor to record the dust concentrations during the works.

With regards to stockpiles:

- stockpiles should be kept to a minimum to reduce 'wind whip' causing potentially hazardous material to be blown from the pile;
- stockpiles should be placed on a suitable polythene membrane to prevent any cross contamination and care should be taken not to pierce the sheeting when placing the bulky elements of the material;
- stockpiles should be dampened down or covered to prevent dust, whilst the final choice should be made by the Contractor based on site constraints, but the options include covering with plastic/polythene membrane, or by a layer of clean soil material; and
- the drop distance from excavator bucket to stockpile will be kept as short as reasonably practicable to reduce dust.

Odour

In general terms the excavation works are not considered likely to give rise to any significant odour problems.

If highly odorous materials are encountered, which may give rise to nuisance to neighbouring properties, appropriate vapour masts shall be deployed to provide suitable odour control. Any odorous materials

shall be covered at the end of each working day and any stockpiles will be located away from any sensitive areas.

Plant and machinery shall be serviced regularly to ensure that exhaust fumes are compliant with best practice and relevant regulations.

Noise

The requirements of the Local Planning Authority and BS 5228: 1997 'Noise and vibration control on construction sites' shall be adhered to at all times.

All machinery shall be fitted with effective silencers and shall be serviced at regular intervals. No items of plant shall be operated with engine covers raised.

The location of any crushing plant shall take into consideration the location of neighbouring properties and other noise sensitive receptors and shall be located away from these areas and located adjacent to proposed stockpile locations where possible.

Asbestos in Soils

The Contractor for each phase of works must manage the risks in accordance with their legal requirements and will need to prepare appropriate health and safety documentation and obtain appropriate approvals, licences, consents and permits prior to commencement.

The remediation works are designed to break the source-pathway-receptor linkage with regards to contaminants within the soil. Whilst appropriate measures are required for all contaminants present, the Contractor should note the additional details provided below with regards to asbestos in the soils:

- Asbestos is a hazard to Human Health when airborne fibres are inhaled. Asbestos containing material (ACM) that is in a bound form (such as asbestos cement tiles) is a low risk where the asbestos fibres cannot become airborne. However, if lagging is present or the ACM is broken or crumbled in a dry condition the asbestos fibres could become airborne and could then be inhaled. When soil with asbestos is covered by hardstanding, buildings or a cover of clean soil or when the soil is kept damp, the asbestos fibres are less likely to become airborne and the risk is greatly reduced.
- The Health and Safety at Work Act 1974 forms the basis of health and safety legislation in the UK. In addition, the Control of Asbestos Regulations 2012 (CAR 2012) applies throughout the UK. CAR 2012 applies if land has significant asbestos content and is relevant to any work conducted on asbestos contaminated land.
- CAR 2012 defines a 'control limit' of 0.1 fibres per cubic centimetre of air averaged over a continuous period of 4 hours. This limit is not risk based and may be much higher than the levels for control of environmental pollution.
- CAR 2012 applies even where exposure to asbestos of employees is sporadic and of low intensity and where exposure to asbestos of any employee will not exceed the control limit. In addition, the work must be of short non-continuous activities where non-friable materials are handled, or removal without deterioration of non-degraded materials in which asbestos fibres are firmly linked in a matrix.

- Lagging, broken fragments of asbestos and loose fibres have the potential to release airborne fibres in dry conditions. In addition, as the ACM and asbestos fibres have been contained in the soil for many years, the likelihood is that they would be degraded to some extent. However, if the asbestos fibres detected at the site are within a soil matrix and if this is kept damp, this should assist in minimising the risk of the release of airborne fibres.
- Given the above factors, it is possible that the works being undertaken would not be exempt from CAR 2012 licensing requirements and it is the Contractors responsibility to assess the licencing position.
- It should be noted that information presented in this document is provided to assist in managing the soil at the site which contains asbestos. Hydrock cannot be held responsible for how the control measures associated with these risks are implemented and recommend that an appropriate asbestos specialist assist with both the preparation of documents and licences and site supervision.

Task specific risk assessments and method statements should be in place, and risks and required mitigation measures communicated to all relevant personnel prior to the works commencing. Appropriate PPE and if required RPE should be provided and utilised.

Visible fragments of suspected asbestos containing materials on the site surface should be handpicked. If hand picking is being undertaken it needs to be undertaken in accordance with and Environmental Permit and ACM shall be placed in a dedicated covered and lockable skip pending off-site disposal to a suitably licensed facility. Such remediation measures will be undertaken by suitably qualified contractors and in accordance with CAR 2012.

Water Quality Controls

The Contractor shall provide for such measures as may be necessary to ensure that water, whether ground water, from precipitation or any other source does not accumulate in excavations or on sub-grades.

Adequate drainage sumps will be installed during works and cut off trenches/dewatering measures will be used as required to manage surface water run-off, to prevent any water from entering watercourses, either directly as surface water run-off, or indirectly via the surface water drainage systems.

If materials escape, appropriate the Contractor is to undertake (at their cost) appropriate remedial action as soon as possible.

Services

Service records are to be provided by the Client for information purposes within the enabling works documentation. However, the Contractor shall be responsible for liaison with the statutory service providers to ensure all service records are current and correct. The Contractor is also responsible for the safe disconnection of existing services entering the site, except those which are to remain operational.

Prior to site work commencing, the position of all services indicated as on site or offsite but close to the site boundary shall be determined and clearly identified where on site. The locations should be confirmed on site by appropriate investigation, observations and survey. Any discrepancies between the anticipated positions and confirmed locations are to be reported to the Client.

All retained manholes should be located and clearly identified on site to prevent damage. The location, depth, diameter and invert level of each manhole and the size and depth of all stream connections shall be recorded. Where drains or sewers are to be grubbed up the downstream ends should be plugged prior to commencement to prevent offsite systems becoming blocked or contaminated.

Where existing drains or sewers are to remain, CCTV surveys are to be provided by the contractor. These surveys must be undertaken on commencement prior to any physical work and on completion to demonstrate no damage has occurred.

Where damage has occurred, any remedial work must be agreed with the Client and relevant authority/owner prior to repairs commencing. The repair costs will be borne by the contractor.

All services on site that are to be retained through the works are to be positively located on site, reliance shall not be placed on existing records. Services are to be visibly marked and protected for the duration of the works. Appropriate methods are to be put in place to ensure all site staff working in the vicinity of retained services are fully briefed.

The Contractor is responsible for ensuring that all hydrant covers, stop tap boxes manhole covers and the like are raised or lowered to suit the finished levels associated with the proposed enabling works plateaus and future construction thicknesses.

Following the completion of the works, a survey plan of the location of terminated services is to be provided.

Damage to Property

All works are to be undertaken in accordance with the Party Wall etc. Act 1996.

The Contractor shall ensure that all precautions are taken in order to avoid any damage to existing property arising from the Works and shall be responsible for same in the event that any damage should arise from his failure to exercise due care.

Any adjacent structures, services and the like shall be inspected prior to commencement of the Works for evidence of existing defects and, if necessary, a dilapidation survey shall be carried out by the contractor, with the agreement of the Client, prior to works commencing on site. A re-inspection shall take place on completion of the Contract to verify that no damage or deterioration of the said structure, service or apparatus has occurred as a result of the Works. A schedule of the findings of this re-inspection shall be circulated to all parties concerned for their records.

The Contractor shall execute the works with care so as to avoid damage to existing structures and drains or other services to be retained.

All fences, trees, paths, shrubs, grassed areas and other surfaces required to be retained shall be protected by the Contractor from spillage and damage caused by site operations and upon completion of the works they shall be handed over in an undamaged and proper state to the satisfaction of the Client.

Refer to landscape architect drawings and specifications that define the areas that require protection. The Contractor shall not raise or lower the ground level beneath the spread of the branches of any tree to be retained without the approval of the Client.

Drawings and Supplied Information

Whilst efforts have been made to ensure that the information provided to the Contractor is correct and current, the Contractor is responsible for corroborating the existing information with the benefit of their site presence and to report any discrepancies encountered or anticipated to the Client immediately.

Where cutting and filling operations are to be carried out the Contractor is to undertake comparative assessments with the benefit of existing information, additional survey and their anticipated sequence of work to ensure sufficient and suitable material is available to undertake the works as proposed. Any anticipated shortfall or surplus is to be report immediately.

Photographs

A detailed dilapidation survey shall be undertaken of the site and adjacent properties including joint site boundaries, in conjunction with adjacent land owners.

Such survey shall include (but not be limited to) roads, footpaths, street lighting and road signs. A copy of the survey, including record photographs shall be provided to the Client within seven days of commencement of site works.

The Contractor is to provide on-site a digital camera and e-mail facilities to enable electronic transfer of site photographs and other information for the full duration of the contract.

Progress photographs are to be taken at least weekly across all parts of the site for inclusion within the contractor's report. Photographs are to be made available to the Consultant and the Client in electronic format should they be requested during the contract. Record photographs should be provided as part of the validation information.

Appendix E

Remediation Options Appraisal

This Remediation Options Appraisal has been undertaken in general accordance with Land contamination: risk management (LCRM) (Environment Agency, 2019). It will inform the remediation of the site and reduce / control the risks associated with relevant pollutant linkages to an acceptable level.

The scope of the Remediation Options Assessment comprises:

- Provision of background information (provided in Section 2).
- A summary of the findings of the Risk Assessments (provided in Section 3).
- Selection of feasible remediation options (for each relevant pollutant linkage).
- A detailed evaluation of options.
- Selection of the final remediation options.

Constraints

Any remediation works need to be designed and undertaken with recognition of the site constraints, with the site located in a generally residential area. Any remediation works will (as much as possible) need to:

- Reduce impact to the adjacent residents with regards to noise, dust, odour and vibration.
- Minimise road traffic by reducing the amount of disposal and maximising re-use of excavated materials.
- Work within the ecological constraints of the site, with works to be restricted to the areas which have had ecological clearance works completed.

Regulatory constraints will also need to be addressed. Detailed regulatory discussions and agreement will be required prior to the finalisation of the remediation scheme.

The site is located on a Secondary A Aquifer. The remediation works (and associated geotechnical mitigation) will need ensure that additional risks to the environment are not caused.

Remediation Objectives

The objectives of the remediation works are as follows:

- to break the linkage between the soils containing isolated detections of asbestos fibres, and future site users;
- unsuitability of the Made Ground as a growing medium;
- to deal with any hotspots of contamination encountered during earthworks.

It should be noted that with regards to potable water supplies and ground gas mitigation (if required), these are not discussed in the Remediation Options Assessment as they are mitigated by prescriptive measures identified by British Standards and good practice.

Selection of feasible remediation options (Options Assessment Tier 1)

In accordance with LCRM (2019), the first stage of an options assessment is to select feasible remediation techniques which can be applied to achieve a site which is suitable for the proposed development.

The initial screening process considers the available remedial techniques based on following key criteria:

- Effectiveness. Will the remediation treatment successfully reduce, or control unacceptable risks to a defined (and appropriate) level? The strategy must work within the context of the site and be effective in the removal of contamination linkages.

- Durability. Can the remediation treatment continue to reduce, or control unacceptable risks to a defined level over a period of time?
- Environmental impact. Will the remediation treatment affect the quality of the environment during or following remediation?
- The (relative) cost. Is the strategy reasonable and affordable, given the available resources?
- Sustainability. Is the option sustainable? More sustainable options are preferred.
- Relative Operational Time. The strategy should work in a feasible and realistic time scale.
- Practicality. The strategy has to have been successfully used in similar situations on other sites and readily available within the UK market. Novel solutions or those still in the research stage would require additional consideration.
- How the strategy meets other environmental objectives. For example, on the use of energy and other material resources.
- Are there any indirect benefits that the remediation would bring? For example, will it enhance the amenity or ecological value of an area, remove blight or encourage regeneration
- The legal, financial and commercial context of the site.

Table 11.1 below summarises the accepted remedial techniques readily available in the UK and assess each against the ten parameters listed above.

Initially the effectiveness at treating the contamination is assessed. This is broken down into: effective (Y), partially effective (P) or ineffective (N).

The durability of each of the remediation options is assessed as either: durable (D) i.e. providing a long-term solution; durable with maintenance requirements (D-M) e.g. gas venting trenches or permeable reactive groundwater barrier, which may require inspections and maintaining; or temporary (T) i.e. providing a short-term solution, but not necessarily effective in the long term e.g. groundwater pump and treat without source removal

The environmental impact is then assessed as: Low (L), Moderate (M) or High (H).

The listed techniques are then assessed in terms of relative cost ranging from: low cost (£), moderately expensive (££), expensive (£££), to prohibitively expensive for the site under consideration (£££+).

Sustainability is assessed based on a relative comparison of: Sustainable (S) or Unsustainable (U).

The timescale over which the remediation technique is operational has been broadly assessed in units of weeks, months, years and decades. If for example a given technique is only effective over a period of years to decades then its overall feasibility is diminished.

Previous site experience, technical literature and Hydrock's in house knowledge have been used to reject impractical and or unsuitable remediation options. The primary reasons for rejection of an option are due to the ongoing operational constraints, the cost and the inability to treat all the required contaminants. If an option is deemed impractical, it is noted in the comments.

Finally, the feasibility of each of the listed remedial option is assessed in terms of effectiveness at treating the contamination, which is broken down into: effective (Y), partially effective (P) or ineffective (N). Additional comments are provided as necessary and if other environmental objectives, indirect benefits or legal implications are identified, these are noted in the comments.

In some instances, there may be a number of treatment options identified and it may not be possible to determine the best practicable option at this stage. In these instances, all potential remedial options are carried forward.

Table 11.1: Applicability of Remediation Options and Initial Assessment – Soils

Remedial Activity	Improve growing medium	Effective on asbestos	Relative Cost	Relative Operational	Feasibility (Y = Yes, N = No)
Cover System	Y	Y	£	Will prevent contact between future site users and deeper soils and break the S-P-R linkage. Will ensure suitable growing medium for new planting.	Y – in conjunction with other technologies.
Excavation and Disposal (may also involve pre-treatment by screening and sorting).	Y	Y	£££+	Will effectively remove the source of the contamination. Excavation and disposal is not considered sustainable. However, dependent upon other factors may be unavoidable. Disposal to be minimised as much as possible by re-use of appropriate soils.	Y – in conjunction with other technologies.
Excavation, Processing and Replacement	Y/N	N	££	Will effectively remove the source of the contamination where it is an identifiable zone. Would need to be undertaken in association with MMP.	Y – in conjunction with other technologies.
Materials Management (Excavation processing and Re-Use of Suitable Materials)	Y	Y	££	Will effectively remove the source of the contamination and place it below the cover system if required. Would not remove hydrocarbons. Would need to be undertaken in association with Material Management Plan (MMP).	Y – in conjunction with other technologies.
Bio-piles	N	N	££	Not appropriate for asbestos contamination.	N
Windrow Turning	N	N	££		
Windrow Turning with addition of additives to stimulating aerobic microbial activity	N	N	££		
Soil Washing	Y/N	N	£££+	Treat process streams (water, sediment) and route to appropriate off-site disposal, as required. Will potentially result in a significant proportion of soils which are geotechnically unsuitable without extensive treatment.	N – due to the creation of geotechnically unsuitable soils, which would require disposal.
Hydraulic Binders	Y	N	££	Not appropriate for asbestos contamination.	N

Detailed evaluation of options (Options Assessment Tier 2)

The short-list of options presented below represents those technologies which were not rejected during the Tier 1 Options Assessment, and are taken forward to the Tier 2 Options Assessment:

Installation of a cover system

Cover systems have been widely used in the UK for managing risks associated with brownfield land developed for residential land uses. The technology involves the placement of a cover to form a barrier between the contaminant and site users thus breaking the source-pathway-receptor linkage.

Subject to site levels available for the installation of the cover, this option is technically simple and represents a low cost strategy that can be implemented rapidly. This needs to be taken into account when establishing formation site levels.

The timescale for installing a barrier is relatively quick allowing for rapid completion of the remediation objectives and this remediation solution could be designed and implemented within a matter of months.

Materials management – excavation, processing, and reuse of suitable materials

Excavation and reuse of suitable materials has been widely used in the UK for managing risks associated with brownfield land. The method involves the excavation of soils, determining the soils suitability (both chemically and geotechnically) and replacement as part of an earthworks programme. The final part of the remediation (if the contaminated soils are not removed from site) would be the placement of a cover to form a barrier between the contaminants and site users, thus breaking the source-pathway-receptor linkages.

Subject to site levels available for the installation of the cover, this option is technically simple and represents a low-cost strategy that can be implemented rapidly. However, in this case the geotechnical constraints of the site require a robust solution to deal with both the geotechnical and contamination issues.

Detailed discussions will be required with the Environment Agency with regards to waste management at the site. It is envisaged that the DoWCoP will be able to be used (at least in part) for the earthworks and materials management at the site. However, there may be a requirement for an Environmental Permit and potentially the requirement for a waste recovery licence.

Disposal of excess or unsuitable soils

Disposal involves the removal of contaminant material from site and disposal at an appropriately licensed waste management facility.

The advantages with regards to excavation and disposal are:

- it represents a relatively rapid remediation strategy; and
- provides a high degree of certainty in the suitability of the site for its intended end use.

The main disadvantages with full Excavation and Disposal are:

- cost of disposal, especially as the majority of the soils would be suitable for use as general fill below the cover system; and
- does not represent a sustainable remediation strategy as significant vehicle movement will be required to and from the site and the contamination is not destroyed but simply relocated to a waste management facility, thus taking up valuable landfill space.

Hydrock does not believe that full disposal of all impacted soils is applicable at the site. However, partial disposal may be required and this option is considered viable if used in conjunction with other techniques or if material is proven to be unsuitable.