Report No: C603/RS
Date: December 2023

REMEDIATION STRATEGY
for land at
25 NORTH STREET, OWSTON FERRY, NORTH LINCOLNSHIRE

Prepared for

Janine Bannard

Prepared by
G&M Consulting Ltd, The Chestnuts, Brackenhill Road, Haxey, Doncaster DN9 2LR

REPORT NUMBER:	C603/RS	**REPORT STATUS:**	Final
REPORT TYPE:	Remediation Strategy		
REPORT DATE:	December 2023		
SITE:	25 North Street, Owston Ferry, North Lincolnshire		
PREPARED FOR:	Janine Bannard		
PREPARED BY:	A Swinbourne BSc. (Hons) FGS, MIEnvSc, ACIEH.		Senior Engineering Geologist
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REMEDIATION STRATEGY
for land at
25 NORTH STREET, OWSTON FERRY, NORTH LINCOLNSHIRE

1 INTRODUCTION.

G&M Consulting Ltd (G&M) was commissioned by Janine Bannard to prepare a Remediation Strategy for land at 25 North Street, Owston Ferry, North Lincolnshire.

It is understood that this report has been commissioned to support the discharge of any contaminated land conditions that may be associated with a planning submission to North Lincolnshire County Council for development of the site for residential purposes. The proposed development layout is shown on Drawing No CWX-JEN-2022-101D, dated March 2022 prepared by Cadworx Ltd; a copy of which is presented in Appendix A of this report.

The location of the site is shown on Drawing No C603/RS/1, presented in Appendix A of this report.

The site has been subject to previous intrusive investigation work, refer to Section 3.1 of this report. This Strategy document incorporates findings and recommendations of this work and provides details of the requirements to remediate the site. This Strategy is intended to detail the approach to be taken to ensure that the risks to sensitive receptors are suitably mitigated, potential risks associated with proven contamination, during the preparatory works are controlled, and that any potential contamination not previously revealed during the recent investigation work is dealt with in an appropriate manner.

The main aims of this strategy are to:

- Satisfy the Local Authority Environmental Protection Department that the remediated site will provide a site ready for development and that it is suitable for its proposed residential with areas of gardens/soft landscaping end use, whilst ensuing that environmental receptors are not put at an unacceptable short-term risk during the development work.
- Ensure construction workers are not put at an unacceptable short-term risk during the development of the site.
- In the interests of sustainability, to promote the use of site-won materials where possible, providing they are suitable for the proposed end use.

Based on the findings of the previous investigation works, it is proposed to incorporate a clean capping layer of 0.60 m thickness, of subsoils and topsoil, into areas of soft landscaping.

Should changes or amendments to the proposed layout, development levels, and / or end use be made, then these should be confirmed by Janine Bannard, and if necessary, amendments made to this Strategy document as appropriate.

No work should be undertaken until the Strategy is approved by the relevant regulators.

2 THE SITE.

2.1 Current Site Description.

The site is a flat lying roughly rectangular shaped piece of land, with the long axis running south-east to north-west. Positioned at approximately 6m above Ordnance Datum, the site covers an area of approximately 0.04 hectares.

The site comprises a number of farm buildings including former workshops and small barns along the northern, western and eastern boundaries. The buildings to the east and west are single storey and are in a poor state of repair, the eastern building is noted to have a pan tile roof, the western buildings have a possible asbestos cement sheet roof. The northern building is a two storey building which is also noted in a poor state of repair, the ground floor of this building is noted to be a former workshop with tooling including old drills noted within the buildings.

The central part of the site is rough grassland and is currently used as parking for the current residence. The site is bounded to the south by an access track, a fuel oil tank is noted adjacent to the southern side of the track, it is noted just off the site and is relatively new. The site is bounded to the east by North Street (from where the site is accessed, to the north by the residence of 25 North Street and to the west by farm buildings associated with an adjacent farm, an above ground fuel tank is noted close to the western boundary of the site associated with the adjacent farm.

A set of site condition photographs have been retained by G&M for inspection if required.

3 BACKGROUND INFORMATION.

3.1 Introduction.

The principal source of information used in the preparation of this Strategy document are as follows;

- 'Preliminary Investigation of land at 25 North Street, Owston Ferry, North Lincolnshire. Report Ref C603, prepared by G&M, dated August 2023.
- 'Geoenvironmental Appraisal of land at 25 North Street, Owston Ferry, North Lincolnshire'. Report Ref C603/1, prepared by G&M, dated December 2023.

Details of the environmental aspects, hydrogeology, geology and regulatory issues associated with the site and subsequent intrusive investigation fieldwork are presented in the above referenced reports.

For completeness, a copy of the text of the above referenced geoenvironmental appraisal (Report Ref C603/1) is presented in Appendix B of this strategy.

3.2 Proven Ground Conditions

Topsoil was proved in trial pits TP02, TP03 and TP04, to depths of between 0.40m and 0.50m bgl. This material is described as soft, dark brown slightly gravelly silty clay locally with a low cobble content. Gravel is subangular fine to coarse of brick. Cobbles are subangular of brick.

TP01, TP05 and TP06 encountered made ground from surface, comprising dark grey slightly clayey sandy subangular fine to coarse gravel sized fragments of tarmac, brick and rare concrete.

This deposit was encountered to depths of between 0.30 and 0.40 m bgl. In TP06 a high cobble content was also recorded. The cobbles were noted to be of brick and is likely the floor of the former barn which was located on site.

In all trial pits, the topsoil or made ground is underlain by a soft, dark brown slightly gravelly very silty clay, locally very clayey silt. The gravel content is subangular fine of reddish brown mudstone. In TP01, the material did not appear to locally grade to very clayey silt.

3.3 Summary of Identified Pollutant Linkages

The conceptual site model detailed within the geoenvironmental appraisal identified the following complete pollutant linkages which could result in an unacceptable risk to the proposed end-users, on the site.

Source	Risk	Potential Contaminants	Exposure Pathway	Primary Receptors	Complete Pollutant Linkage
Topsoil/Made Ground - on site	Moderate	Locally elevated concentrations of Dibenz(a,h)anthracene, Lead and Arsenic.	Skin contact Ingestion Inhalation	Construction workers, end users built development, End users (Residential),	**Yes:** Residential properties are likely to have gardens and areas of soft landscaping, clean capping of gardens and areas of soft landscaping will be required.

4 REMEDIATION STRATEGY.

4.1 Summary.

The Remediation Strategy follows the principles of Land Contamination Risk Management (LCRM) - Environment Agency, April 2021.

The LCRM recommends that remedial action proposed for the site should be justified. Remedial action has been justified due to the pollution linkages identified within this report. The remediation options have been developed to meet the technical objectives for the development with the major drivers behind the recommendations being:

- To achieve successful remediation within a particular timescale and budget;
- Familiarity with the methodology by the developer/ground worker;
- Confidence that the remediation can be carried out by good technical practices; and,
- Likely success of the proposed method of remediation.

It has been assumed, in the preparation of this Strategy, that the proposed end use is a residential development, with areas of private garden and that development ground levels will not change significantly from those encountered during the fieldwork. If either of these assumptions are incorrect, then amendments to the suggested options within this report may be required.

4.2 Options Appraisal

The driver for remediation of the site is the presence of existing made ground and topsoil within the proposed areas of soft landscaping that contain elevated PAH speciate Dibenz(a,h)anthracene, Lead and Arsenic., considered to pose an unacceptable long-term risk to human health (end-users). Remediation of these soils within the areas of proposed hardstanding is discussed further within this Strategy document.

The method chosen for remediation must be achievable by the groundworker, using techniques that they are familiar with. It is therefore considered that the remediation proposals should comprise the provision of a cover system to sever the contaminant pathways in the proposed areas of garden, where the end users may reasonably be expected to come into contact with the soils and where soil dust may be derived.

The approach is considered to be equally straightforward, and both would be an effective approach to reducing risk to the end users of the site to an acceptable level.

Where made ground is left beneath areas of proposed hardstand (building footprints and car parking etc), it is considered to pose a **negligible** risk to end users, as pathways are severed due to capping by the hardstanding.

Due to the fact that testing of the underlying natural subsoil found no levels of contaminants elevated above GAC levels, any of this material excavated as part of the foundations, may be stockpiled for re-use within the areas of soft landscaping. This soil should be stripped and placed into temporary stockpile, and further confirmatory testing undertaken.

5 STRATEGY DETAIL.

5.1 General.

The main requirements of the remediation and preparatory works are given below in the approximate sequence of works. Pertinent elements of the works are discussed in greater detail in subsequent sections of this document:

- Demolition of existing barns present on site. Prior to demolition an asbestos survey should be undertaken. Any asbestos containing materials identified should be removed in a controlled manner and disposed of to a suitably licensed facility.
- Site strip and clearance of all vegetation and any surface debris materials present on site,
- Removal and disposal from site to a suitably licenced facility, of unsuitable made ground soils identified in the previous site investigation works in areas of gardens / soft landscaping or encountered as part of the site strip or foundation construction. The contractor undertaking the preparatory works shall be responsible for this and for ensuring that all relevant regulations, permits/licences and recording keeping are met.
- Placement of ‘clean cover soil capping layers to areas of proposed private gardens which fall within areas of chemical failure found within the Phase 2 investigation, using clean soils to achieve a minimum 600mm thick clean cover layer incorporating a minimum thickness of at least 150mm topsoil. Where such soils are imported to site appropriate chemical testing shall be carried out and provided to the local authority, prior to import for written approval; see section 6.
- Construction of clean cover soil capping layer to be validated on completion by a suitably qualified geoenvironmental engineer. Thickness of the capping layer should be validated physically on site, and a programme of laboratory testing will be implemented to confirm chemical suitability; see section 6.
- A watching brief to identify any previously unidentified sources of contamination. If any grossly contaminated soils, liquid or dumped wastes, materials suspected to contain asbestos or similar are encountered during the preparatory/development works, then advice should be sought from a suitably qualified geoenvironmental engineer; see section 5.5.
- A validation report will be produced by a suitably qualified geoenvironmental engineer on completion of the works. This report will serve to provide a record of the remediation works including the results of the chemical testing to confirm the works were undertaken in accordance with the relevant legislation, this Strategy and planning conditions; see section 7.

Should areas of significant contamination be encountered during the development works, such as noxious, odorous, fibrous or liquid etc., then works should stop immediately and further advice sought from a suitably experienced and qualified consultant.

5.2 Excavation and Disposal of Materials from Site

It is proposed that where made ground materials are present within areas of proposed gardens, these materials will require capping in order to construct a clean capping soil system, refer to Section 6 of this report. Made ground soils from these areas may require disposal from site.

The previous investigation work identified elevated concentrations of PAH speciate Dibenz(a,h)anthracene, Lead and Arsenic within the made ground soils.

In order to minimise the potential for dust emissions, the following measures may be employed during the remediation works;

- Excavation and stockpiling works to be undertaken in a controlled systematic manner;
- Damping down during the excavation works as required:
- Stockpiles to be sealed or covered where necessary:
- Any vehicles used for disposal of materials from site to be sheeted to prevent fugitive dust emissions.

Waste Management Strategy
Any unsuitable materials which are to be exported from site, should be dispatched to a suitably licenced landfill facility, in accordance with the requirements of the Duty of Care (DoC) Regulations, April 2006 and where appropriate, the HWR, 2005 or any superseding legislation.

The Contractor is responsible for arranging laboratory analysis for waste classification and (if necessary) waste acceptance criteria (WAC) purposes and shall be submitted to the operator of the point of disposal to make a preliminary assessment.

The waste disposal routes for excavated soils and other materials to landfill, recycling or treatment facilities will be determined by the Contractor and will follow relevant guidance and legislation.

The Contractor will provide all relevant documentation on completion of the work, including:

- methods used to classify the waste and the results of the classification;
- results of WAC analysis (if required);
- the place of disposal;
- waste volumes; and
- waste transfer notes and other Duty of Care information. (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 of its chemical composition).

The above information/documentation shall be included within the verification report detailed in Section 7 of this strategy.

5.3 Material Import Protocol.

All materials and imported aggregates should be sourced from a reputable supplier and require certification to determine the materials suitability for use, where scheduled for placement on site prior to importation. Separate certification is required for each type of material utilised. All imported materials will need to be accompanied with chemical certification to demonstrate its suitability for use on-site.

Imported materials should be compliant with the description in Appendix 2 of the CL:AIRE DoWCoP. This refers to the direct use of clean, naturally occurring soil and mineral materials. By using only naturally

occurring soil and mineral materials, waste legislation would not apply, i.e. the site will not require an Environmental Permit or Waste Exemption. The materials must be sourced from:

- Greenfield sites not subject to past contaminative use; or
- Brownfield sites where the natural soils have been extensively characterised and proven to be clean.

Evidence of suitability for use must be provided, i.e. from desk-based research for a greenfield site; or from site investigation data from a brownfield site.

5.4 Health and Safety.

On the basis of the results obtained, the revised conceptual model confirms potential moderate risk to construction workers from PAH speciate Dibenz(a,h)anthracene, Lead and Arsenic in the made ground soils. However, risks can be readily adequately mitigated by appropriate PPE and hygiene precautions and good working and soil management practices.

During the site development it will be necessary to protect health and safety of 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, hard hats, footwear and gloves;
- All personnel shall wear hard hats, high visibility clothing and protective footwear at all times;
- Hand washing facilities shall be provided;
- No smoking except in designated areas; and,
- Good practices relating to personal hygiene shall be adopted.

Specific Risk Assessments and Method Statements may need to be prepared by the contractor responsible for the development works, to take into account potential issues detailed above.

This Strategy document should be forwarded to any organisation undertaking groundworks in order for them to assess the risk to their own personnel.

5.5 Unforeseen Contamination Protocol.

There is a possibility that contamination is encountered that were not identified by past intrusive investigation.

Should areas of significant previously unidentified contamination be encountered during the development works, then works should stop immediately and advice sought from a suitably qualified geoenvironmental engineer. Site staff will be made aware of the history of the site and will be expected to report suspected contamination based on;

- Unusual appearance such as colour
- Unusual texture such as fibrous or glassy
- Presence of liquids or sludges
- Aromatic, stringent or pungent odour
- Eye or throat irritation

Dependent on the advice of the geoenvironmental engineer, the suspected contamination will be dealt with using existing procedures or details may be submitted to the local authority and a remediation procedure

agreed.

6 COVER MATERIALS.

6.1 General.

Due to the presence of contamination in the made ground and because of its unsuitability as a growing medium, it is recommended within any areas of proposed soft landscaping, a suitable thickness of clean capping soils are placed.

The design of the capping layer is subject to regulatory consultation.

Where made ground is left beneath the area of the footprint of the dwelling and other areas of proposed hardstand (driveways, paths and car parking etc), it is considered to pose a **negligible** risk to end users, as pathways are severed due to capping by the hardstanding.

A drawing reference C603/3 showing areas of the site to be remediated by means of clean capping is presented in Appendix A of this report.

Where soft landscaping is proposed, the clean capping soils should be increased, as detailed below;

Table- 1 Clean Cover Layer Thickness.

	Subsoil (mm)	Topsoil (mm)	Total (mm)
Soft landscaped/ garden areas	450	150	600

The clean capping thickness shall conform to the requirements of BRE 465:2004 'Cover Systems for Land Regeneration'

Should all the made ground be removed, which is likely considering the thickness of these materials encountered during the investigation, then providing that no visual or olfactory evidence of suspected contamination is noted, within the underlying natural subsoils, and chemical testing of the resultant surface is undertaken, no specific depth of cover would be required, beyond that needed to provide a suitable thickness of growing medium.

Due to the fact that testing of the underlying natural subsoil found no levels of contaminants elevated above GAC levels, any of this material excavated as part of the foundations, may be stockpiled for re-use within the areas of soft landscaping. This soil should be stripped and placed into temporary stockpile, and further confirmatory testing undertaken.

If any imported materials are to be stockpiled on site prior to use then these stockpiles should be located on 'clean' surfaces and placed on a geotextile separator to minimize the risk of any cross contamination. Any stockpiles should be sealed, by 'blading', to reduce water ingress and softening. It is recommended, however, to avoid any cross contamination that the import of any soils onto site should be left until the final stages of landscaping works and placed as soon as reasonably practicable.

6.2 Topsoil.

Shall be placed by the contractor responsible for the development works. It shall be ensured that topsoil is of an appropriate quality, naturally derived, and that concentrations of contaminants do not exceed the maximum concentrations stipulated in Table 2 presented in Section 6.4 of this Strategy, see below.

Any imported topsoil shall conform to the requirements of BS3882:2015.

6.3 Subsoil.

Subsoil materials for the use in the 'clean' cover layer shall be a naturally derived product and shall be clean and free of foreign debris, building waste materials, timber or other deleterious matter.

Materials to be imported to site shall be sampled at source and the test results made available to the local authority prior to any material being delivered to site.

It shall be ensured that the subsoil is of an appropriate quality and that concentrations of contaminants do not exceed the maximum concentrations stipulated in Table 2 presented in Section 6.4 of this Strategy, see below.

6.4 Chemical Suitability.

All materials for use in the 'clean' cover layer shall be analysed at a UKAS and MCERTS accredited laboratory for testing in accordance with the following schedule.

For this site, measured values shall be compared to the GACs derived for a residential with plant uptake end use. The threshold guideline values are given in the table below;

Table 2. Clean Capping - Guidance Values.

Determinand	GAC (1% SOM) (mg/kg, unless otherwise stated)
Arsenic	37 (2)
Cadmium	11(1)
Chromium (Hexavalent)	21 (2)
Lead	200 (2)
Mercury	40 (1)
Selenium	250 (1)
Copper	2400 (1)
Nickel	180 (1)
Zinc	3700 (1)
pH	<5
Water Soluble Sulphate	0.5 g/l (4)
PAH	
Acenaphthene	210(1)
Anthracene	2400(1)
Acenaphthylene	170(1)
Benzo(a)anthracene	7.2(1
Benzo(b)fluoranthene	2.6(1)
Benzo(k)fluoranthene	77(1)
Benzo(g,h,i)perylene	320(1)
Benzo(a)pyrene	5.0(2)
Chrysene	15(1)
Dibenz(a,h)anthracene	0.24(1)
Fluoranthene	280(1)
Fluorene	170(1)
Indeno(1,2,3-cd)pyrene	27(1)
Naphthalene	2.3(1)
Pyrene	620(1)
Phenanthrene	95(1)
TPH	

Aliphatic EC 5-6	42(1)
Aliphatic EC >6-8	100(1)
Aliphatic EC >8-10	27(1)
Aliphatic EC >10-12	130(1)
Aliphatic EC >12-16	1100(1)
Aliphatic EC >16-35	65,000(1)
Aromatic EC 5-7	70(1)
Aromatic EC >7-8	130(1)
Aromatic EC >8-10	34(1)
Aromatic EC >10-12	74(1)
Aromatic EC >12-16	140(1)
Aromatic EC >16-21	260(1)
Aromatic EC >21-35	1100(2)
Other	
Monohydric Phenol	120(1)
Asbestos	Fibres Present

[1] LQM/CIEH (2015) S4UL's for Human Health Risk Assessment. 2nd Ed. (for a sandy soil with 1% SOM and pH 7.0)
[2] DEFRA C4SL's, DEFRA 2015
[3] BRE (2005) Special Digest 1, 3rd Edition, Concrete in aggressive ground. Upper limits for DS-1 Design Sulphate Class concrete.

6.5 Placement.

The contractor undertaking the development works shall be responsible for the placement of the clean cover materials.

The thickness and quality of the capping layer shall be validated in accordance with the following best practice guidance;

- Validation Requirements for Cover Systems – Version 4.1, June 2021. (Yorkshire and Lincolnshire Pollution Advisory Group),

For completeness, a copy of this guidance is presented in Appendix C of this strategy.

Following placement of the clean cover layer, care will be taken to prevent cross contamination of the capping layer with underlying materials.

7 POST RECLAMATION REQUIREMENTS.

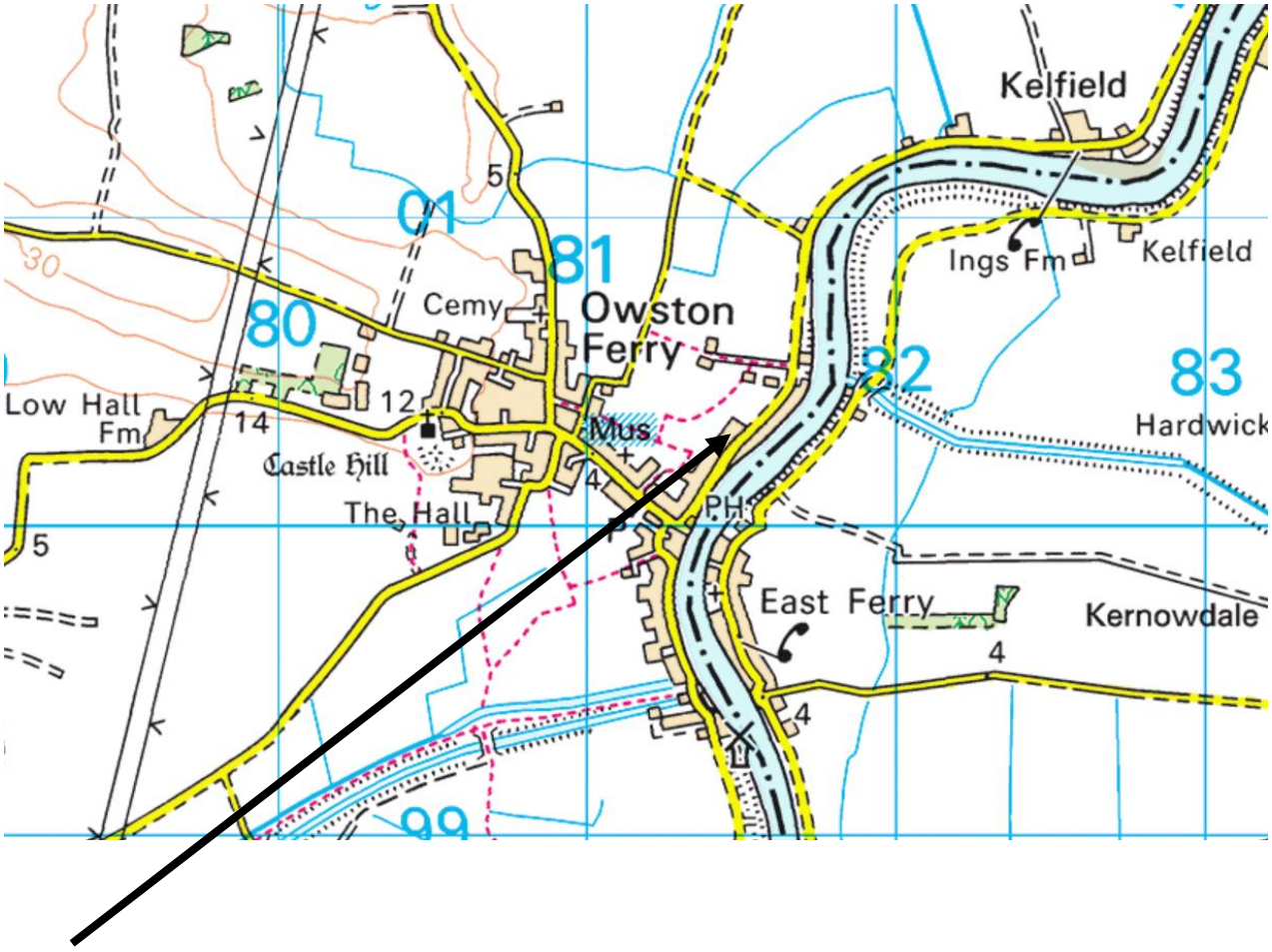
Following the development works a validation report shall be prepared and submitted to the local authority for approval.

The validation report shall include the following:

- Description of the works undertaken.
- Asbestos survey report.
- Report of findings for further investigation work.
- Waste Transfer Notes, including any asbestos containing materials and made ground materials disposed of from site.
- Clean capping chemical validation report, where clean cap soils are placed to areas of gardens and soft landscaping. This should include for confirmatory testing of existing soils present on site, for use as clean capping soils.
- Chemical validation test results.
- Statement that the works have been carried out in accordance with the agreed Strategy.

APPENDIX A

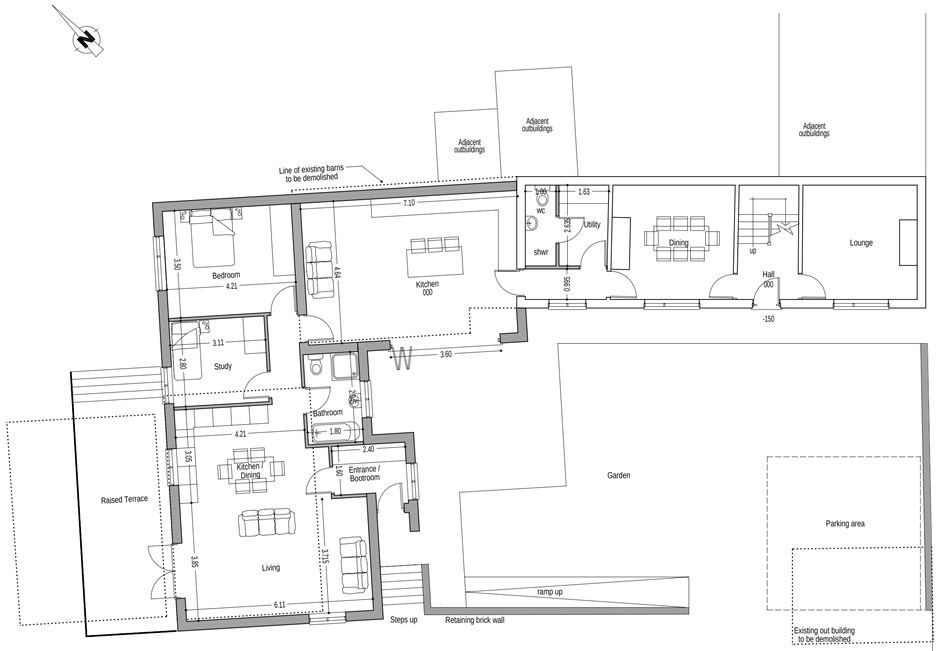
DRAWINGS



The Site

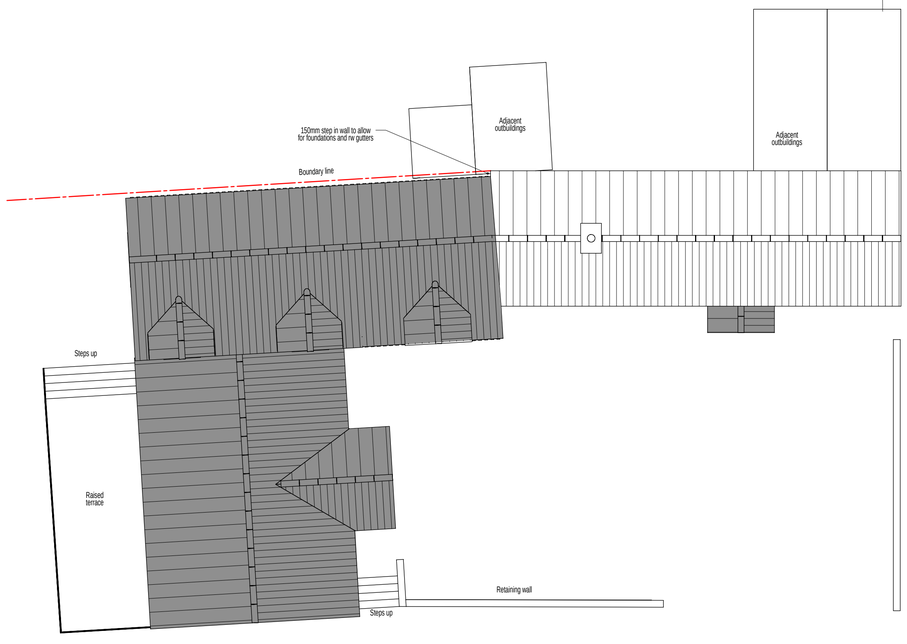
Site Location Plan **Drawing No C603/RS/1**

G&M CONSULTING



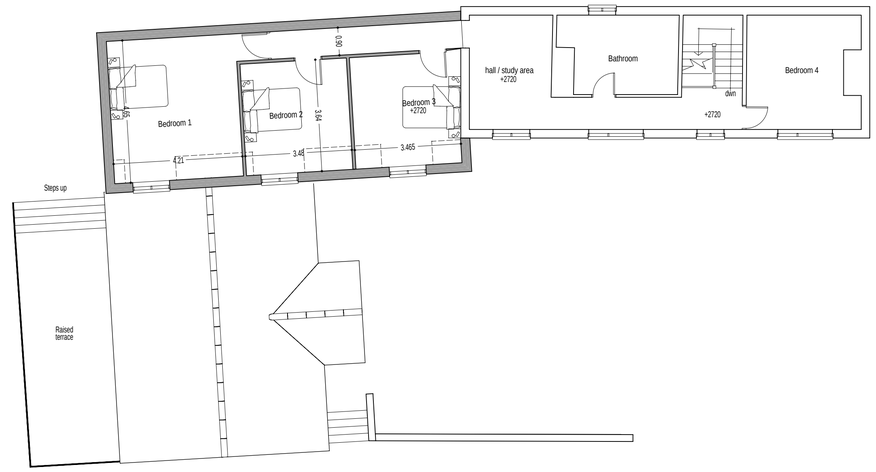
PROPOSED GROUND FLOOR PLAN
1:100

FLOOD RISK MAXTRIX
As the application site is in Flood Zone 3 the floor levels within the proposed development will be set no lower than the existing levels AND, flood proofing of the proposed development will be incorporated where appropriate in line with the guidance contained in the government document 'Improving the Flood Performance of New Buildings: Flood Resilient Construction'



North Street

PROPOSED ROOF PLAN



PROPOSED FIRST FLOOR PLAN

PROPOSED SITE PLAN
1:500

D - Size of proposed extension reduced 04-05-2023

Cadworx Ltd
Architectural design and 3d Visualisations

Linden House, Bracken Hill Road
East Lound, Nr Doncaster DN9 2LR

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Project
ALTERATIONS AND EXTENSIONS TO EXISTING DWELLING TO CREATE ADDITIONAL ACCOMMODATION INCLUDING GROUND FLOOR ANNEX

25 NORTH STREET
OWTSON FERRY

Title:
PROPOSED PLANS

Scale	Date	Drawn
1:100 @ A1	03-2022	DS

Drawing No.
CWX-JEN-2022-101D

A B C D E F G H J

APPENDIX B

PREVIOUS INVESTIGATION REPORT

Report No: C603/1
Date: December 2023

GEOENVIRONMENTAL APPRAISAL
Of land at
25 NORTH ROAD, OWSTON FERRY, NORTH LINCOLNSHIRE

Prepared for
Janine Bannard

Prepared by
G&M Consulting Ltd, The Chestnuts, Brackenhill Road, Haxey, Doncaster DN9 2LR

REPORT NUMBER:	C603/1	**REPORT STATUS:**	Final
REPORT TYPE:	Geoenvironmental Appraisal		
REPORT DATE:	December 2023		
SITE:	25 North Street, Owston Ferry, North Lincolnshire		
PREPARED FOR:	Janine Bannard		
PREPARED BY:	A Swinbourne BSc. (Hons) FGS, MIEnvSc, ACIEH.		Senior Engineering Geologist
REVIEWED BY:	G Swinbourne BSc. (Hons) MSc. DIC, FGS		Principal Engineering Geologist

APPENDICES

GEOENVIRONMENTAL APPRAISAL
for land at
25 NORTH STREET, OWSTON FERRY, NORTH LINCOLNSHIRE

1.0 INTRODUCTION.

G&M Consulting Ltd (G&M) was commissioned by Janine Bannard, to undertake a geoenvironmental appraisal of a plot of land at 25 North Street, Owston Ferry, North Lincolnshire. It is understood that approval has been granted by North Lincolnshire Council (NLC) reference PA/2022/765, for alternations to the current layout, including the addition of ground floor accommodation. This report has been commissioned to support the discharge Condition No 4 of the above referenced approval. The proposed development layout is shown on Drawing No CWX-JEN-2022-101D, dated March 2022 prepared by Cadworx Ltd; a copy of which is presented in Appendix A of this report.

The geoenvironmental appraisal of the site has been undertaken in two phases. The initial phase (Phase 1) was a preliminary investigation (desk study) which was prepared by G&M in August 2023 (Report Ref C603). Based on the results of the preliminary investigation, G&M has undertaken an intrusive site investigation (Phase 2), of the proposed area of development.

This report details the results of the intrusive investigation and makes recommendations with regards to the proposed development. This report should be read in conjunction with the desk study, which contains a description of the site, environmental setting and initial conceptual site model (CSM) from which the rationale for the intrusive investigation was derived.

The aims of this investigation are as follows;

- To determine the shallow ground conditions beneath the site;
- To determine the nature and degree of any possible near surface ground and groundwater contamination;
- To produce a revised conceptual site model based on the findings of the intrusive investigation and the preliminary conceptual site model from the desk study: and,
- To provide recommendations on measures to deal with any contamination present on site, if encountered.

The fieldwork for the intrusive investigation was undertaken on the 24th November 2023 and comprised the excavation of six trial pits. Following completion of the fieldwork selected soil samples were scheduled for a range of chemical laboratory tests.

1.1 Limitations.

This investigation report, which is designed to meet the requirements of all relevant current guidance, presents the factual information available during this appraisal, interpretation of the data obtained and recommendations relevant to the defined objectives.

The comments and opinions presented in this report are based on the findings of a review of available information and ground conditions encountered during the intrusive investigation work. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation. Any diagram or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

During the course of the works G&M did not notice the presence of any Japanese Knotweed. However, it should be noted that G&M are not qualified ecologists and as such cannot guarantee the absence of

knotweed or other invasive vegetation. If necessary the possible presence of such vegetation should be confirmed by a qualified ecologist.

This report is intended for the sole use of Janine Bannard or her representative. No other third party may rely upon or reproduce the contents of this report without the written authorisation of the report author. If any unauthorised third party comes into possession of this report they rely on it at their own risk and the author does not owe them any Duty of Care or Skill.

1.2 Site Location.

The site is located on North Street, close to the centre of the village of Owston Ferry, approximately 13km south west of Scunthorpe town centre, at National Grid Reference SE 814 002. A site location plan is shown on Drawing No. C603/1/1, presented in Appendix A of this report.

Site Features.

The site is a flat lying roughly rectangular shaped piece of land, with the long axis running south-east to north-west. Positioned at approximately 6m above Ordnance Datum, the site covers an area of approximately 0.04 hectares.

The site comprises a number of farm buildings including former workshops and small barns along the northern, western and eastern boundaries. The buildings to the east and west are single storey and are in a poor state of repair, the eastern building is noted to have a pan tile roof, the western buildings have a possible asbestos cement sheet roof. The northern building is a two storey building which is also noted in a poor state of repair, the ground floor of this building is noted to be a former workshop with tooling including old drills noted within the buildings.

The central part of the site is rough grassland and is currently used as parking for the current residence. The site is bounded to the south by an access track, a fuel oil tank is noted adjacent to the southern side of the track, it is noted just off the site and is relatively new. The site is bounded to the east by North Street (from where the site is accessed, to the north by the residence of 25 North Street and to the west by farm buildings associated with an adjacent farm, an above ground fuel tank is noted close to the western boundary of the site associated with the adjacent farm.

A set of site condition photographs have been retained by G&M for inspection if required, however photos were provided within the Phase 1 report, referenced above.

2.0 GROUND INVESTIGATION

The Phase 1 desk study prepared previously, referenced above, was used as the basis for the design of an appropriate intrusive ground investigation. The main findings of the desk study as given in the summary to the report were as follows:

- *Based on a review of the historical maps for the area, the site would appear to have been occupied by agricultural buildings since at least 1885.*
- *The site comprises a number of farm buildings including former workshops and small barns along the northern, western and eastern boundaries. The buildings to the east and west are single storey and are in a poor state of repair, the eastern building is noted to have a pan tile roof, the western buildings have a possible asbestos cement sheet roof. The northern building is a two storey building which is also noted in a poor state of repair, the ground floor of this building is noted to be a former workshop with tooling including old drills noted within the buildings.*
- *No significant off-site sources of contamination were identified, based on the available information, with the exception of an above ground fuel tank located adjacent to the western boundary of the site and associated with the neighbouring farm.*

- *Regarding the possibility of ground gas generation, this should be managed by further refining the conceptual model, with respect to ground gas risks and developing a strategy that involves either;*
  A suitably designed programme of ground gas monitoring at and around the location of the proposed residential property, that will determine if ground gases that may affect the development are present. The monitoring should be followed by an appropriate risk assessment and recommendations for building protection. OR Gas protection measures should be provided for the new residential structure. The gas protection measures should be in accordance with 'Characteristic Situation 2' as defined in CIRIA C665:(2007), 'Assessing risks posed by hazardous ground gases to buildings' These measures should be suitably validated.
- *The risks outlined above necessitate a Phase 2 intrusive ground investigation, the outline scope of which should comprise;*
  A series of shallow trial pits should be excavated around the existing garages to adequately characterise the made ground and shallow natural soils in this area of the site. In-field soil sampling and screening (utilising a Photo Ionisation Detector (PID)).
  Soil samples should be collected in appropriate containers and subject to chemical soil analysis including, asbestos screen tests, as well as a range of testing suites including, The testing of soils should include for a full suite of metals, pH, water soluble sulphate, speciated PAH, speciated TPH, herbicides/pesticides and screening for Asbestos. A geoenvironmental appraisal report should be prepared and if necessary, a remediation strategy.

The aim and purpose of the ground investigation was to verify the nature and depth of the shallow made ground, natural soils and groundwater across the site, to allow informed decisions on potential remediation options that might be required in order to break the direct contact exposure pathways.

Ground Gas Risk Assessment.
Regarding the possibility of ground gas generation, this should be managed by further refining the conceptual model, with respect to ground gas risks and developing a strategy that involves either;

A suitably designed programme of ground gas monitoring at and around the location of the proposed residential property, that will determine if ground gases that may affect the development are present. The monitoring should be followed by an appropriate risk assessment and recommendations for building protection.

or

Gas protection measures should be provided for the new residential structure. The gas protection measures should be in accordance with 'Characteristic Situation 2' as defined in CIRIA C665:(2007), 'Assessing risks posed by hazardous ground gases to buildings' These measures should be suitably validated.

Radon protection measures are **not** shown to be required for any new build properties at the site.

2.1 Scope of Works.

The scope of the intrusive investigation is detailed below;

Exploratory Hole Type	Purpose
Trial Pits	To determine the general nature of shallow soils underlying the site, including the; Nature, distribution and thickness of any potential made ground. Nature, degree and extent of ground contamination. Determination of the presence of shallow underlying natural ground To help identify and inform suitable remedial options

Fieldwork was undertaken on the 24th November 2023, and comprised;

- Excavation of six trial pits, referenced TP01 to TP06 inclusive, to depths of between 1.00 m and 1.30 m bgl

The exploratory hole positions were set out and the fieldwork supervised by a G&M engineering geologist. The locations of the exploratory holes are shown on Drawing No C603/1/2, presented in Appendix A of this report.

The investigation was scoped using guidance presented in BS 10175:2011+A2:2017, CIRIA C665:2007, the principals of Land Contamination Risk Management (LCRM) - Environment Agency April 2021 and BS EN 1997:2004 and 2007.

Machine excavated trial pits were excavated using a 1.5-tonne rated 360º tracked machine. A photographic record of the trial pits is presented in Appendix D of this report.

2.2 Strata Description.

Depths and descriptions of strata encountered together with details of the samples recovered are presented on the exploratory hole record sheets contained in Appendix B of this report. Procedures and principles contained in BS EN ISO 14688-1 (2002), as amplified by BS 5930 (2015+A1:2020), were followed. The depths of strata on the record sheets are recorded from current ground levels at each location.

2.3 Sampling/In-situ Testing

Small disturbed samples of soil, for chemical analysis, were placed in amber glass jars as appropriate. Between boreholes, equipment was thoroughly cleaned and dried.

In accordance with best practice (BS10175:2011+A2:2017) samples were collected in appropriate containers, kept in a chilled cool box whilst on site, retained in a fridge (below 2ºC) until the day of collection, packed in a chilled cool box on the day of collection and transported in this to the laboratory.

2.4 Laboratory Testing

Selected soil samples were tested for a range of potential contaminants, under a sub-contract with i2 Analytical Ltd (i2), a UKAS/MCERTS accredited laboratory. The analytes tested are listed in Section 4.2 of this report. The results of soil analysis, as received from the laboratory, are presented in Appendix C of this report.

3.0 GROUND CONDITIONS AND MATERIAL PROPERTIES

A complete record of all the strata encountered is presented on the attached exploratory hole logs. In general these show a veneer of made ground/topsoil over superficial deposits comprising slightly gravelly silty clays.

3.1 Made Ground/Topsoil

Topsoil was proved in trial pits TP02, TP03 and TP04, to depths of between 0.40m and 0.50m bgl. This material is described as soft, dark brown slightly gravelly silty clay locally with a low cobble content. Gravel is subangular fine to coarse of brick. Cobbles are subangular of brick.

TP01, TP05 and TP06 encountered made ground from surface, comprising dark grey slightly clayey sandy subangular fine to coarse gravel sized fragments of tarmac, brick and rare concrete.

This deposit was encountered to depths of between 0.30 and 0.40 m bgl. In TP06 a high cobble content was also recorded. The cobbles were noted to be of brick and is likely the floor of the former barn which was located on site.

3.2 Natural Deposits

In all trial pits, the topsoil or made ground is underlain by a soft, dark brown slightly gravelly very silty clay, locally very clayey silt. The gravel content is subangular fine of reddish brown mudstone. In TP01, the material did not appear to locally grade to very clayey silt.

3.3 Groundwater

No groundwater was encountered in any of the trial pits during the fieldwork.

It should be borne in mind that water levels are likely to fluctuate with season/rainfall and may therefore be higher at wetter times of year than those found during this investigation.

3.4 Visual / Olfactory Evidence of Contamination

Fragments of concrete, tarmac and brick were recorded in the made ground in varying amounts across the site. which can produce elevated concentrations of certain toxic and phytotoxic contaminants.

No olfactory evidence of any contamination was noted during the fieldwork.

Headspace testing on selected samples, recovered as the fieldwork proceeded, using a PID did not record any elevated levels of VOCs. The results of this testing are presented on the respective trial pit logs presented in Appendix B of this report.

4.0 RESULTS OF CHEMICAL TESTING

4.1 General

For this site, measured values were compared to Generic Assessment Criteria (GAC) derived for a residential with plant up take end use.

Chemical analysis was undertaken on representative soil samples recovered from across the site. The determinands were selected to provide information on the distribution of potential contaminants. The general analytical suite was supplemented with additional analysis where former land usage, as determined from the desk study, or visual or olfactory observations suggested the presence of additional contaminants.

The majority of initial screening levels (GAC's) used in the production of this assessment have been taken from the guidelines introduced by:

- DEFRA C4SL's, DEFRA 2015
- Joint Land Quality Management Ltd (LQM) and Chartered Institute of Environmental Health (CIEH), Generic Assessment Criteria for Human Health Risk Assessment, S4UL's, Land Quality Press 2015.

Usually statistical testing is undertaken for the Planning Scenario by the methods described in CL:AIRE "Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration", September 2020. This statistical testing is undertaken to determine whether there was sufficient evidence that the true mean concentration of each determinand was less than the relevant critical concentration for that component. However, given the fact that a proportion of the sampling was carried out on a targeted basis, detailed statistical assessment of the data has not been conducted, instead individual contaminant concentrations have been compared to their relevant assessment criteria.

4.2 Testing Schedule

Following completion of the fieldwork samples were selected for testing as follows;

Laboratory Analysis	Topsoil/Made Ground	Subsoil
Total concentrations of arsenic, cadmium, chromium (Hexavalent), copper, lead, nickel, selenium, zinc, mercury	6	4
Water soluble sulphate, pH	6	2
Phenol	6	2
Speciated PAH	6	4
Asbestos	5	-
BTEX	3	-
Speciated TPH	3	-
Herbicide/Pesticide Screen	3	-

4.3 Soil Analysis

The chemical analysis results and screening criteria are summarised below. The results for the made ground and natural soils have been combined for an initial assessment.

Summary of Total Soil Concentrations

Determinand	GAC (1% SOM) (mg/kg, unless otherwise stated)	No. of samples above screening value	No. of samples tested	Concentrations above GAC (mg/kg, unless otherwise stated)
Metals/Metalloids				
Arsenic	37 (2)	1	10	54 - (TP04-0.20m)
Cadmium	10(1)	0	10	
Chromium (VI)	21 (2)	0	10	
Lead	200 (2)	2	10	660 - (TP04-0.20m) 340 - (TP03-0.30m)
Mercury	40 (1)	0	10	
Selenium	250 (1)	0	10	
Copper	2400 (1)	0	10	
Nickel	180 (1)	0	10	
Zinc	3700 (1)	0	10	
Inorganics				
pH	<5	0	8	
Water Soluble Sulphate	0.5 g/l (3)	0	8	
Organics				
PAHs				
Acenaphthene	210(1)	0	10	
Anthracene	2400(1)	0	10	
Acenaphthylene	170(1)	0	10	
Benzo(a)anthracene	7.2(1	0	10	
Benzo(b)fluoranthene	2.6(1)	0	10	
Benzo(k)fluoranthene	77(1)	0	10	
Benzo(g,h,i)perylene	320(1)	0	10	
Benzo(a)pyrene	5.0(2)	0	10	
Chrysene	15(1)	0	10	
Dibenz(a,h)anthracene	0.24(1)	2	10	0.29 - (TP04-0.20m)

Determinand	GAC (1% SOM) (mg/kg, unless otherwise stated)	No. of samples above screening value	No. of samples tested	Concentrations above GAC (mg/kg, unless otherwise stated)
				0.27 - (TP5-0.10m)
Fluoranthene	280(1)	0	10	
Fluorene	170(1)	0	10	
Indeno(1,2,3-cd)pyrene	27(1)	0	10	
Naphthalene	2.3(1)	0	10	
Pyrene	620(1)	0	10	
Phenanthrene	95(1)	0	10	
Others				
Aliphatic EC 5-6	42(1)	0	3	
Aliphatic EC >6-8	100(1)	0	3	
Aliphatic EC >8-10	27(1)	0	3	
Aliphatic EC >10-12	130(1)	0	3	
Aliphatic EC >12-16	1,100(1)	0	3	
Aliphatic EC >16-35	65,000(1)	0	3	
Aromatic EC 5-7	70(1)	0	3	
Aromatic EC >7-8	130(1)	0	3	
Aromatic EC >8-10	34(1)	0	3	
Aromatic EC >10-12	74(1)	0	3	
Aromatic EC >12-16	140(1)	0	3	
Aromatic EC >16-21	260(1)	0	3	
Aromatic EC >21-35	1,100(1)	0	3	
Benzene	0.87(1)	0	3	
Toluene	130(1)	0	3	
Ethylbenzene	47(1)	0	3	
M xylene + P xylene	59(1) + 5.6(1)	0	3	
O xylene	61(1)	0	3	
Others				
Monohydric Phenol	280(1)	0	8	
Asbestos	Fibres present	0	5	

[1] LQM/CIEH (2015) Generic Assessment Criteria for Human Health Risk Assessment. 2nd Ed. (for a sandy soil with 1% SOM and pH 7.0)
[2] DEFRA C4SL's, DEFRA 2015
[3] BRE (2005) Special Digest 1, 3rd Edition, Concrete in aggressive ground. Upper limits for DS-1 Design Sulphate Class concrete.

The PAH speciate Dibenz(a,h)anthracene, was found to be elevated in two samples of the made ground/topsoil (TP05 at 0.10m and TP04 at 0.20m)

Lead was recorded above its threshold in two samples of made ground/topsoil (TP03 at 0.30m and TP04 at 0.20m)

Arsenic was recorded above its threshold in one samples of made ground/topsoil (TP04 at 0.20m)

As a precautionary measure, considering the previous use of the site, a herbicide/pesticide screen was undertaken on three samples of the made ground. No detectable concentrations of determinands were recorded.

None of the samples taken from the natural sub-soils recorded concentrations in excess of the relevant screening values detailed above.

No asbestos was identified in any of the five samples of the made ground/topsoil tested.

5.0 QUALITATIVE RISK ASSESSMENTAND REVISED CONCEPTUAL MODEL

Following the ground investigation and results of the chemical testing presented above, the preliminary conceptual site model presented in the Phase 1 desk study has been revised. The revised model has been developed for the proposed future land use (residential with plant uptake).

Identified Contaminants of Concern

- Localised elevated PAH speciate Dibenz(a,h)anthracene was shown to be elevated above GAC values in the made ground/topsoil within TP04 and TP05.
- Localised elevated Lead was shown to be elevated above its GAC value in the made ground/topsoil within TP03 and TP04.
- Localised elevated Arsenic was noted to be elevated above its GAC value in the made ground/topsoil within TP04.

Summary of Identified Pollutant Linkages

In summary the revised conceptual site model has identified the following potential pollutant which could result in an unacceptable risk to the proposed end-use, denoted as a moderate or higher potential of significant pollutant linkage on the conceptual site model.

Source	Risk	Potential Contaminants	Exposure Pathway	Primary Receptors	Complete Pollutant Linkage
Topsoil/Made Ground - on site	Moderate	Locally elevated concentrations of Dibenz(a,h)anthracene, Lead and Arsenic.	Skin contact Ingestion Inhalation	Construction workers, end users built development, End users (Residential),	**Yes:** Residential properties are likely to have gardens and areas of soft landscaping, clean capping of gardens and areas of soft landscaping will be required.

6.0 CONCLUSIONS AND RECOMMENDATIONS.

6.1 General

G&M Consulting Ltd (G&M) was commissioned by Janine Bannard, to undertake a geoenvironmental appraisal of a plot of land at 25 North Street, Owston Ferry, North Lincolnshire. It is understood that approval has been granted by North Lincolnshire Council (NLC) reference PA/2022/765, for alternations to the current layout, including the addition of ground floor accommodation. This report has been commissioned to support the discharge Condition No 4 of the above referenced approval. The proposed development layout is shown on Drawing No CWX-JEN-2022-101D, dated March 2022 prepared by Cadworx Ltd; a copy of which is presented in Appendix A of this report.

It has been assumed that ground levels will not change significantly from those described in this report, or that the proposed end use of the site will not change from that detailed above. If this is not the case, then amendments to the interpretation and conclusions in this report may be required.

6.2 Contamination Constraints to Development

Risk Evaluation for Proposed Land Use (Residential With Plant Update)

Elevated concentrations of PAH speciate Dibenz(a,h)anthracene, Lead and Arsenic have been identified within the topsoil/made ground materials on the site. The elevated concentrations of contaminants are considered to pose a moderate risk to future site users. Consequently, remedial action is therefore considered necessary to break the potential pollutant linkage.

If made ground is left beneath areas of proposed hardstand (building footprints and car parking etc), it is considered to pose a negligible risk to end users, as pathways are severed due to capping by the hardstanding.

If made ground is left on site in areas of private gardens or soft landscaping, there will be a need to place clean cover soils. This is to provide a healthy medium for plant growth and to remove any remaining pathways for exposure of end users to residual contaminants. It is recommended that a

minimum of 600mm of clean capping soils (including 150mm of clean topsoil) are placed. This thickness is subject to regulatory approval.

Should all the made ground be removed, which is likely in areas of the proposed development, considering the thickness of these materials encountered during the investigation (typically between 0.30 m and 0.50m bgl), then providing that no visual or olfactory evidence of suspected contamination is noted, within the underlying natural subsoils, and chemical testing of the resultant surface is undertaken, no specific depth of cover would be required, beyond that needed to provide a suitable thickness of growing medium.

As discussed within the Phase 1 report, prior to any proposed development work the existing buildings on site should be subject to an asbestos survey, undertaken by a suitably qualified person/organisation. Any asbestos containing materials identified should be disposed of from site in a controlled manner, to a suitably licenced facility.

Controlled Waters

No groundwater was encountered during the investigation.

Considering the above and the fact that the made ground soils will be either removed or capped with hard stand or clean capping soils (thereby effectively eliminating surface water infiltration and leachate generation), it is considered that the soils are considered to pose a low risk to controlled waters and that no further remediation is considered necessary, outside of that described.

Construction and Maintenance Workers

Risks identified within this report can be readily adequately mitigated by appropriate PPE and hygiene precautions and good working and soil management practices, including dampening down of soils. It is recommended that procedures outlined in the HSE document 'Protection of Workers and the General Public during Remediation of Contaminated Land' be followed.

If necessary, any work shall comply with the Control of Asbestos Regulations, 2012.

This report should be forwarded to any organisation undertaking groundworks in order for them to assess the risk to their own personnel.

Adjacent Site Users

Provided any made ground materials are carefully excavated and standard dust control measures are adopted, including dampening down of soils, during the development works, then it is considered that there is a **negligible** short-term risk to adjacent site users.

Built Development

This assessment of the potential for chemical attack on buried concrete is based on current guidance contained in BRE Special Digest 1 ('SD1', 2005) Concrete in Aggressive Ground Part 1: Assessing the aggressive chemical environment. Third Edition.

Water soluble sulphate and pH tests, carried out as part of the contamination testing on six samples of made ground/topsoil and two samples of natural soils, returned values in the range 7.8 to 8.4 and 8.0 and 8.1, respectively for pH and 0.0366 to 0.31 g/l and 0.107 to 0.195 g/l, respectively for water soluble sulphate.

From these characteristic values for the design of buried concrete are derived. For the made ground characteristic values for pH of 7.8 and water soluble sulphate of 0.31 g/l are indicated. For the natural soils characteristic values for pH of 8.0 and water soluble sulphate content of 0.195 g/l are indicated.

Using the worst case, i.e. the results for made ground natural soils and Table C1 from SD1, a Design Sulphate Class for the site of DS-1, where concrete is in contact with the made ground materials remaining on site and a Design Sulphate Class for the site of DS-1 is also indicated for the natural soils.

Utilities
It is recommended that the results of the chemical testing are provided to the appropriate utility companies to determine the necessity for service protection.

6.2 Watching Brief during Development Works

Given the history of the site, it is possible that areas of contamination or made ground may be encountered during the development works, which have not been identified by this report.

If any areas of noxious, odorous, fibrous or liquid etc. contamination are encountered, then works should stop immediately, the local authority informed and further advice sought from a suitably experienced and qualified consultant. It is recommended that a watching brief be maintained during the development work for this purpose.

It is recommended that a further inspection is made of the underlying soils following removal of the former barns and concrete slabs on which they are located. The inspection should be made by a suitably qualified and experienced geoenvironmental consultant.

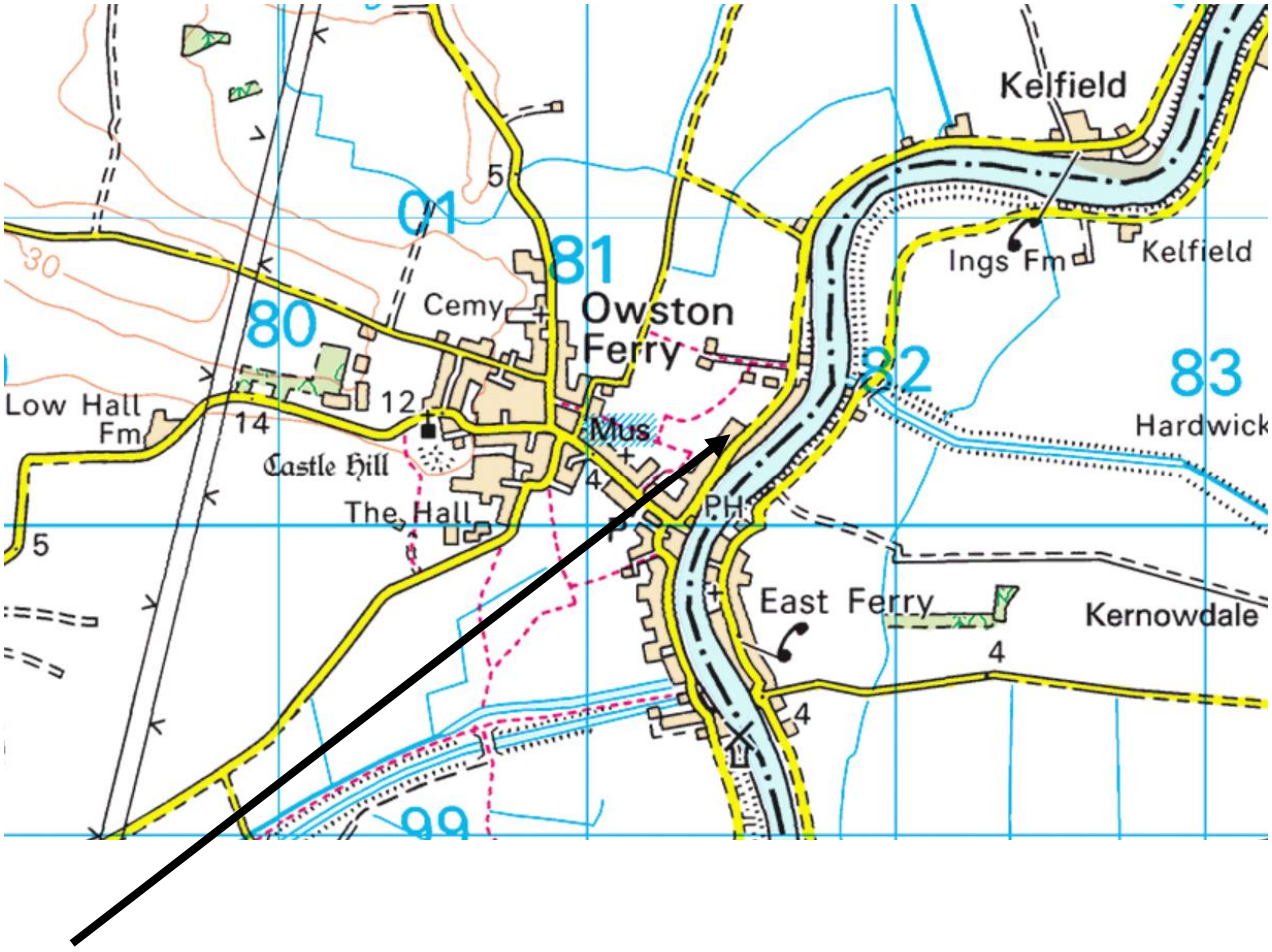
6.3 Regulatory Approval

The conclusions and recommendations presented above are considered practical based on the findings of this investigation. The conclusions and recommendations cannot, however, be guaranteed to gain regulatory approval, and therefore this report should be submitted to the regulators for their comment/approval as part of any planning process.

The above recommendations comprise a general outline of possible or likely works. A remediation strategy report should be produced and agreed with the regulatory authorities prior to development.

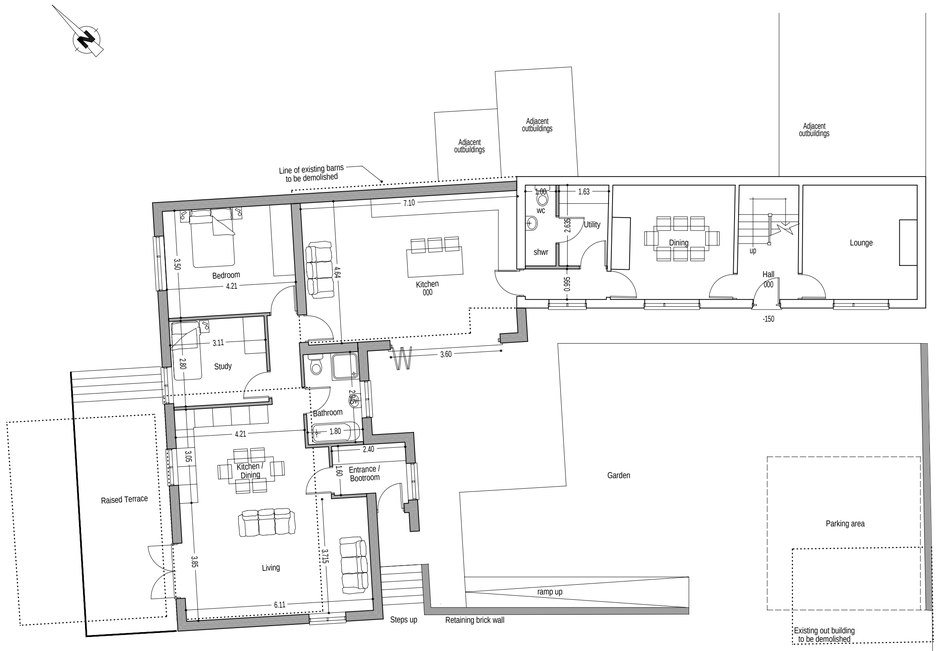
APPENDIX A

DRAWINGS



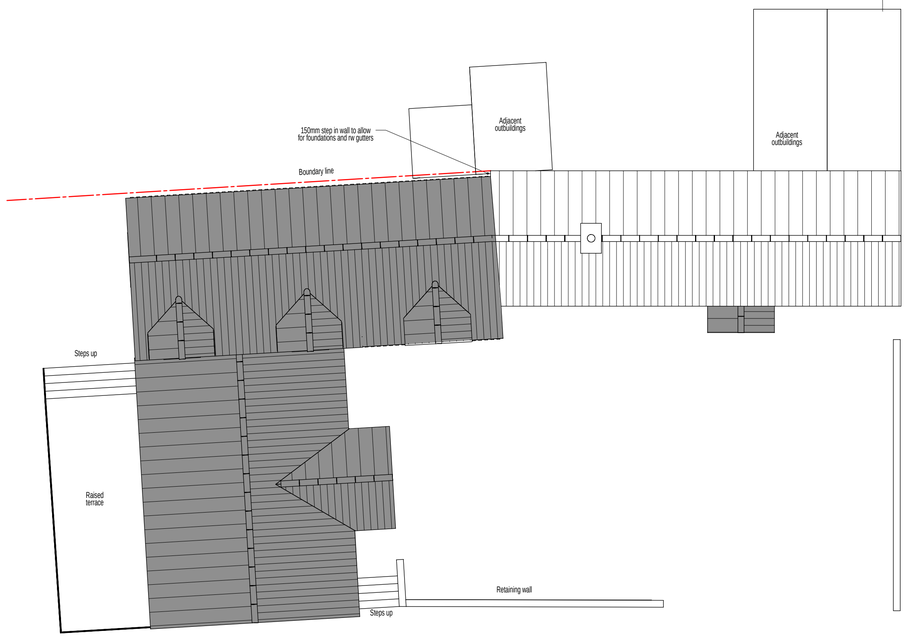
Site Location Plan **Drawing No C603/1/1**

G&M CONSULTING



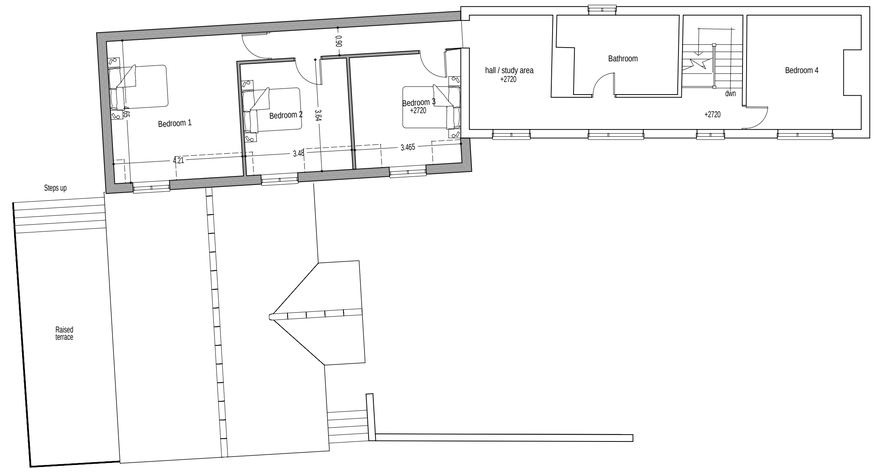
PROPOSED GROUND FLOOR PLAN
1:100

FLOOD RISK MAXTRIX
As the application site is in Flood Zone 3 the floor levels within the proposed development will be set no lower than the existing levels AND, flood proofing of the proposed development will be incorporated where appropriate in line with the guidance contained in the government document 'Improving the Flood Performance of New Buildings: Flood Resilient Construction'



North Street

PROPOSED ROOF PLAN



PROPOSED FIRST FLOOR PLAN

PROPOSED SITE PLAN
1:500

D - Size of proposed extension reduced 04-05-2023

Cadworx Ltd
Architectural design and 3d Visualisations

Linden House, Bracken Hill Road
East Lound, Nr Doncaster DN9 2LR

tel 01427 753232
danny@3dcadworx.com

Project
ALTERATIONS AND EXTENSIONS TO EXISTING DWELLING TO CREATE ADDITIONAL ACCOMMODATION INCLUDING GROUND FLOOR ANNEX

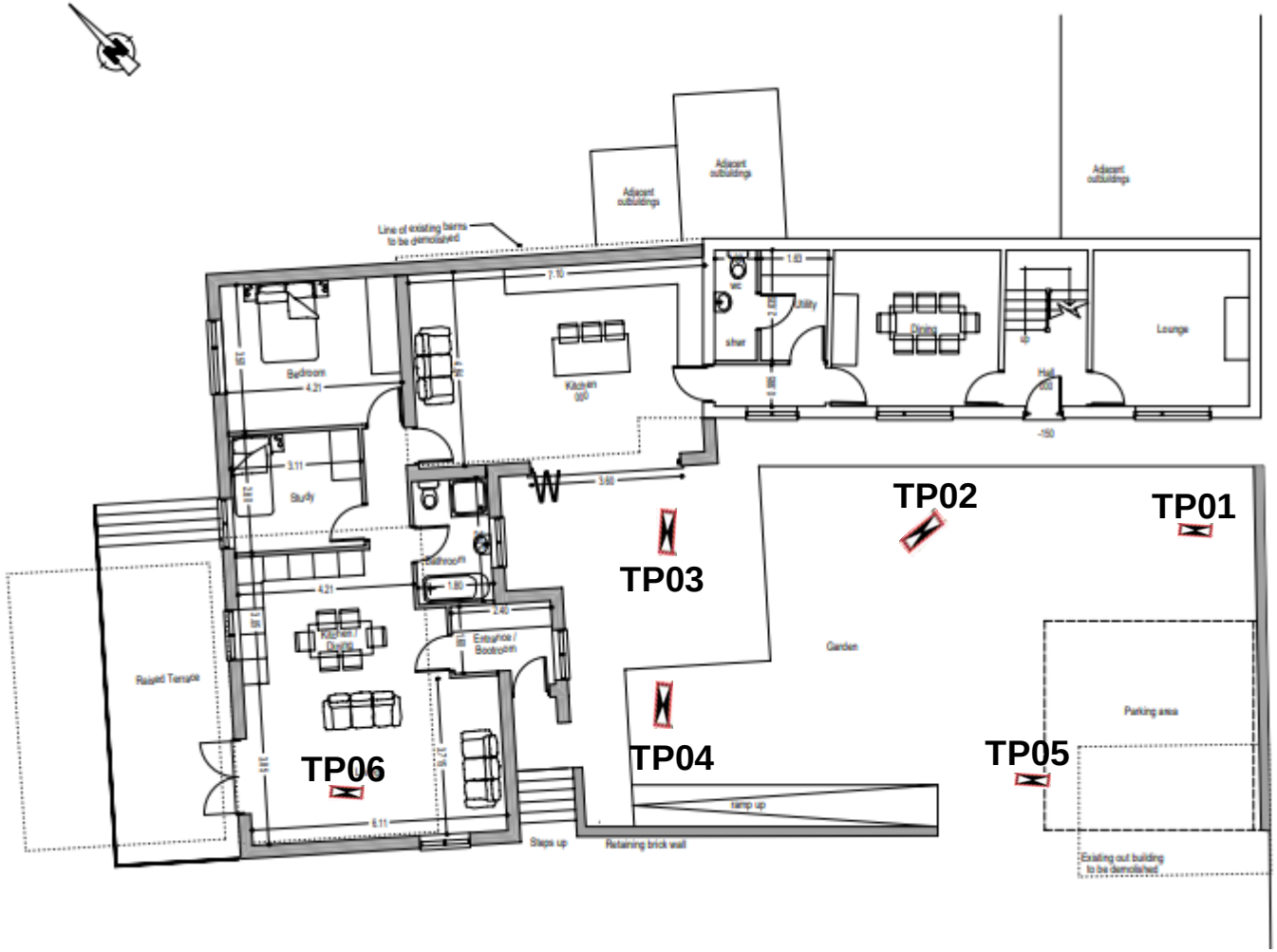
25 NORTH STREET
OWTSON FERRY

Title:
PROPOSED PLANS

Scale	Date	Drawn
1:100 @ A1	03-2022	DS

Drawing No.
CWX-JEN-2022-101D

A B C D E F G H J



Drawing:	**C603/1/2**	**Scale NTS**	
Contract	**C603 – 25 North Street Owston Ferry**	**Drawn AS**	**Approved** GS
		Drawing Name – Trial Pit Location Plan	
Client: Janine Bannard			

G&M CONSULTING

APPENDIX B

EXPLORATORY HOLE RECORDS

Trial Pit Record

				TP No	**1**
				Contract No	**C603**
Method:	Machine excavated trial pit using a 1.5 tonne rated tracked excavator	**Site**	**25 North Street, Owston Ferry**	**Date**	**24/11/23**
				Scale	**1:25**
		Client	**Janine Bannard**	**Logged By**	**ATS**

Sample Details			**Description**	**Depth (m)**	**Level (mAOD)**	**Legend**
Type	**Depth** To-from (m)	**Vane** kN/m²				
ES PID	0.20 0.20	0	MADE GROUND: Dark grey slightly clayey sandy subangular fine to coarse GRAVEL sized fragments of tarmac, brick and rare concrete	0.40		
ES PID	0.50 0.50	0	Soft, dark brown slightly gravelly very silty CLAY. Gravel is subangular fine of reddish brown mudstone From 0.60m: Becoming light brown			
PID	1.00	0		1.00		
			Trial Pit Complete at 1.00m			

Remarks

Faces stable during excavation
No groundwater encountered
Pit dimension = 0.45x1.50m

Sample Types

D - Disturbed
B - Bulk
W - Water
ES - Environmental

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Trial Pit Record

				TP No	**2**
				Contract No	**C603**
Method:	Machine excavated trial pit using a 1.5 tonne rated tracked excavator	**Site**	**25 North Street, Owston Ferry**	**Date**	**24/11/23**
				Scale	**1:25**
		Client	**Janine Bannard**	**Logged By**	**ATS**

Sample Details						
Type	**Depth** To-from (m)	**Vane** kN/m²	**Description**	**Depth (m)**	**Level (mAOD)**	**Legend**
ES	0.10					
PID	0.20	0	MADE GROUND: Soft, dark brown slightly gravelly silty CLAY. Gravel is subangular fine to medium of brick (TOPSOIL)			
PID	0.50	0		0.50		
ES	0.70		Soft, light greyish brown slightly gravelly very silty CLAY, locally very clayey SILT. Gravel is subangular fine to medium of reddish brown mudstone			
				1.30		
			Trial Pit Complete at 1.30m			

Remarks

Faces stable during excavation
No groundwater encountered
Pit dimension = 0.45x1.70m

Sample Types

D - Disturbed
B - Bulk
W - Water
ES - Environmental

G&M CONSULTING

Trial Pit Record

				TP No	**3**
				Contract No	**C603**
Method:	Machine excavated trial pit using a 1.5 tonne rated tracked excavator	**Site**	**25 North Street, Owston Ferry**	**Date**	**24/11/23**
				Scale	**1:25**
		Client	**Janine Bannard**	**Logged By**	**ATS**

Sample Details			**Description**	**Depth (m)**	**Level (mAOD)**	**Legend**
Type	**Depth** To-from (m)	**Vane** kN/m²				
PID ES	0.20 0.30	0	MADE GROUND: Soft, dark brown slightly gravelly silty CLAY with a low cobble content. Gravel is subangular fine to coarse of brick. Cobbles are subangular of brick (TOPSOIL)	0.40		
PID	0.50	0	Soft, light greyish brown slightly gravelly very silty CLAY, locally very clayey SILT. Gravel is subangular fine to medium of reddish brown mudstone			
ES	0.80					
PID	1.00	0		1.20		
			Trial Pit Complete at 1.20m			

Remarks

Faces stable during excavation
No groundwater encountered
Pit dimension = 0.45x2.00m

Sample Types

D - Disturbed
B - Bulk
W - Water
ES - Environmental

G&M CONSULTING

Trial Pit Record

				TP No	**4**
				Contract No	**C603**
Method:	Machine excavated trial pit using a 1.5 tonne rated tracked excavator	**Site**	**25 North Street, Owston Ferry**	**Date**	**24/11/23**
				Scale	**1:25**
		Client	**Janine Bannard**	**Logged By**	**ATS**

Sample Details						
Type	**Depth** To-from (m)	**Vane** kN/m^2	**Description**	**Depth (m)**	**Level (mAOD)**	**Legend**
ES PID	0.20 0.20	0	MADE GROUND: Soft, dark brown slightly gravelly silty CLAY with a low cobble content. Gravel is subangular fine to coarse of brick. Cobbles are subangular of brick (TOPSOIL)	0.40		
PID	0.50	0	Soft, light greyish brown slightly gravelly very silty CLAY, locally very clayey SILT. Gravel is subangular fine to medium of reddish brown mudstone			
ES	1.00			1.20		
			Trial Pit Complete at 1.20m			

Remarks

Faces stable during excavation
No groundwater encountered - Water noted in pit base from ground level
Pit dimension = 0.45x1.50m

Sample Types

D - Disturbed
B - Bulk
W - Water
ES - Environmental

G&M CONSULTING

Trial Pit Record

TP No	5
Contract No	C603
Date	24/11/23
Scale	1:25
Logged By	ATS

Method:	Machine excavated trial pit using a 1.5 tonne rated tracked excavator	**Site**	**25 North Street, Owston Ferry**	
		Client	**Janine Bannard**	

Sample Details			Description	Depth (m)	Level (mAOD)	Legend
Type	**Depth** To-from (m)	**Vane** kN/m²				
ES PID	0.10 0.10	0	MADE GROUND: Dark grey slightly clayey sandy subangular fine to coarse GRAVEL sized fragments of tarmac, brick and rare concrete	0.30		
PID ES	0.50 0.60	0	Soft, dark brown slightly gravelly very silty CLAY locally very clayey SILT Gravel is subangular fine of reddish brown mudstone From 0.70m: Becoming light brown	1.00		
			Trial Pit Complete at 1.00m			

Remarks

Faces stable during excavation
No groundwater encountered
Pit dimension = 0.45x1.50m

Sample Types

D - Disturbed
B - Bulk
W - Water
ES - Environmental

G&M CONSULTING

Trial Pit Record

				TP No	**6**
				Contract No	**C603**
Method:	Machine excavated trial pit using a 1.5 tonne rated tracked excavator	**Site**	**25 North Street, Owston Ferry**	**Date**	**24/11/23**
				Scale	**1:25**
		Client	**Janine Bannard**	**Logged By**	**ATS**

Sample Details						
Type	**Depth** To-from (m)	**Vane** kN/m²	**Description**	**Depth (m)**	**Level (mAOD)**	**Legend**
ES	0.20		MADE GROUND: Dark grey slightly clayey sandy subangular fine to coarse GRAVEL sized fragments of tarmac, brick and rare concrete with a high cobble content, cobbles are subangular of whole brick. Frequent tree rootlets	0.40		
PID	0.20	0				
PID	0.50	0				
ES	0.80		Soft, light greyish brown slightly gravelly very silty CLAY, locally very clayey SILT. Gravel is subangular fine to medium of reddish brown mudstone			
PID	1.00	0		1.10		
			Trial Pit Complete at 1.10m			

Remarks

Faces stable during excavation
No groundwater encountered
Pit dimension = 0.80x1.50m

Sample Types

D - Disturbed
B - Bulk
W - Water
ES - Environmental

G&M CONSULTING

APPENDIX C

LABORATORY TEST RESULTS

Andrew Swinbourne
G & M Consulting Ltd
The Chestnuts
Brackenhill Road
East Lound
Haxey
Doncaster
DN9 2 LR

[redacted]

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

[redacted]

Analytical Report Number : 23-71519

Project / Site name:	25 North Street, Owston Ferry	**Samples received on:**	27/11/2023
Your job number:	C603	**Samples instructed on/ Analysis started on:**	28/11/2023
Your order number:		**Analysis completed by:**	06/12/2023
Report Issue Number:	1	**Report issued on:**	06/12/2023
Samples Analysed:	10 soil samples		

Signed: [redacted]

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

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

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

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

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

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

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

Analytical Report Number: 23-71519

Project / Site name: 25 North Street, Owston Ferry

Lab Sample Number				2892466	2892467	2892468	2892469	2892470
Sample Reference				TP01	TP01	TP02	TP02	TP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.10	0.70	0.30
Date Sampled				24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	19	22	24	23	22
Total mass of sample received	kg	0.001	NONE	0.2	0.3	0.3	0.4	0.3
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	EWS	N/A	EWS	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	-	8	8.1	8.4
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.31	-	0.0731	0.107	0.118
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.8	0.29	0.32	0.24	0.22
Acenaphthylene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.07	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.1	< 0.05	0.67	< 0.05	0.29
Anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05	0.12	< 0.05	0.06
Fluoranthene	mg/kg	0.05	MCERTS	2.7	< 0.05	1.9	< 0.05	0.88
Pyrene	mg/kg	0.05	MCERTS	2.4	< 0.05	1.7	< 0.05	0.83
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.5	< 0.05	1	< 0.05	0.54
Chrysene	mg/kg	0.05	MCERTS	1.6	< 0.05	1.2	< 0.05	0.6
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.9	< 0.05	1.4	< 0.05	0.7
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.74	< 0.05	0.54	< 0.05	0.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5	< 0.05	1.1	< 0.05	0.62
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1	< 0.05	0.71	< 0.05	0.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	< 0.05	0.81	< 0.05	0.48
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	16.8	< 0.80	11.6	< 0.80	5.91

Analytical Report Number: 23-71519

Project / Site name: 25 North Street, Owston Ferry

Lab Sample Number				2892466	2892467	2892468	2892469	2892470
Sample Reference				TP01	TP01	TP02	TP02	TP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.50	0.10	0.70	0.30
Date Sampled				24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	8.7	15	8.9	21
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	25	18	20	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37	21	35	17	150
Lead (aqua regia extractable)	mg/kg	1	MCERTS	150	25	190	25	340
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	24	15	20	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	85	66	120	68	130
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	-	-	-	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-	-	-	< 5.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	< 0.020	-	-	-	< 0.020
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	< 0.020	-	-	-	< 0.020
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.05	NONE	< 0.050	-	-	-	< 0.050
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	-	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	< 10	-	-	-	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	< 0.010	-	-	-	< 0.010
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	< 0.010	-	-	-	< 0.010
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.05	NONE	< 0.050	-	-	-	< 0.050
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	< 2.0	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	< 10	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	11	-	-	-	< 10
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	17	-	-	-	10
Pesticide and Herbicide Screen								
GCMS Pesticide Screen		N/A	NONE	-	-	-	-	None Detected

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

Analytical Report Number: 23-71519

Project / Site name: 25 North Street, Owston Ferry

Lab Sample Number				2892471	2892472	2892473	2892474	2892475
Sample Reference				TP04	TP05	TP05	TP06	TP06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.60	0.20	0.80
Date Sampled				24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	23	24	24	26	25
Total mass of sample received	kg	0.001	NONE	0.3	0.4	0.3	0.3	0.3
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	EWS	EWS	N/A	EWS	N/A

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.2	-	7.8	8
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.125	0.0366	-	0.11	0.195

Total Phenols

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

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.44	0.22	0.18	0.26	0.12
Acenaphthylene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05	0.06	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.07	0.06	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.14	0.07	< 0.05	0.06	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	2.3	1.2	< 0.05	0.78	0.16
Anthracene	mg/kg	0.05	MCERTS	0.25	0.28	< 0.05	0.15	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	4	3	0.07	2.2	0.36
Pyrene	mg/kg	0.05	MCERTS	3.4	2.6	0.07	1.9	0.32
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2	1.5	< 0.05	1.1	0.18
Chrysene	mg/kg	0.05	MCERTS	2.3	1.6	< 0.05	1.3	0.23
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.6	1.8	< 0.05	1.6	0.3
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1	0.78	< 0.05	0.59	0.08
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.1	1.5	< 0.05	1.3	0.23
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.3	0.93	< 0.05	0.88	0.17
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.29	0.27	< 0.05	0.18	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.5	1.1	< 0.05	0.96	0.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	23.7	16.8	< 0.80	13.3	2.33

Analytical Report Number: 23-71519
Project / Site name: 25 North Street, Owston Ferry

Lab Sample Number				2892471	2892472	2892473	2892474	2892475
Sample Reference				TP04	TP05	TP05	TP06	TP06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.60	0.20	0.80
Date Sampled				24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	54	20	8.8	13	9.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.3	0.5	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	24	26	24	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	150	56	23	33	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	660	120	33	110	46
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	33	24	22	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	310	140	89	130	85
Monoaromatics & Oxygenates								
Benzene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
Toluene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
p & m-xylene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
o-xylene	µg/kg	5	MCERTS	-	-	-	< 5.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	< 5.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	-	-	-	< 0.020	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.02	NONE	-	-	-	< 0.020	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.05	NONE	-	-	-	< 0.050	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	NONE	-	-	-	< 10	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	-	-	-	< 0.010	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.01	NONE	-	-	-	< 0.010	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.05	NONE	-	-	-	< 0.050	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	NONE	-	-	-	14	-
Pesticide and Herbicide Screen								
GCMS Pesticide Screen		N/A	NONE	-	None Detected	-	None Detected	-

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

Analytical Report Number : 23-71519

Project / Site name: 25 North Street, Owston Ferry

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2892466	TP01	None Supplied	0.2	Brown loam with gravel.
2892467	TP01	None Supplied	0.5	Brown clay with gravel and vegetation.
2892468	TP02	None Supplied	0.1	Brown loam with gravel and vegetation.
2892469	TP02	None Supplied	0.7	Brown clay and sand with gravel.
2892470	TP03	None Supplied	0.3	Brown loam with vegetation.
2892471	TP04	None Supplied	0.2	Brown loam and sand with gravel and vegetation.
2892472	TP05	None Supplied	0.1	Brown loam and sand with gravel and vegetation.
2892473	TP05	None Supplied	0.6	Brown clay.
2892474	TP06	None Supplied	0.2	Brown loam with vegetation.
2892475	TP06	None Supplied	0.8	Brown clay.

Analytical Report Number : 23-71519
Project / Site name: 25 North Street, Owston Ferry

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. Refer to CoA for analyte specific accreditation.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260. Refer to CoA for analyte specific accreditation	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. Refer to CoA for band specific accreditation.	In-house method with silica gel split/clean up.	L088/76-PL	D	MCERTS
GC Pesticide Screen (TIC)	Analysis of unknown pesticides by GCMS	GC Pesticide Screen (TIC)	L064B	D	NONE

Analytical Report Number : 23-71519
Project / Site name: 25 North Street, Owston Ferry

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

APPENDIX D

TRIAL PIT PHOTOGRAPHS

Project Number: C603	**Project Name:** 25 North Street, Owston Ferry
Client: Janine Bannard	**Document Name:** Trial Pit Photographs: TP01 (1.00m), TP02 (1.30m), TP03 (1.20m), TP04 (1.20m)

Project Number: C603	**Project Name:** 25 North Street, Owston Ferry
Client: Janine Bannard	**Document Name:** Trial Pit Photographs: TP05 (1.00m), TP06 (1.10m).

G&M CONSULTING

APPENDIX C

VALIDATION REQUIREMENTS
FOR COVER SYSTEMS

VERIFICATION REQUIREMENTS FOR COVER SYSTEMS

Technical Guidance for Developers, Landowners and Consultants

Yorkshire and Lincolnshire Pollution Advisory Group

Version 4.1 – June 2021

The purpose of this guidance is to promote consistency and good practice for development on land affected by contamination. The Local Authorities in Yorkshire, Lincolnshire, the North East of England, East Anglia, Greater Manchester and St Helens who have adopted this guidance are shown below:

Contents

Disclaimer

This guidance is intended to serve as an informative and helpful source of advice. YALPAG will review this guidance every three years, but readers must note that legislation, guidance and practical methods are inevitably subject to change and therefore should be aware of current UK policy and best practice. This note should be read in conjunction with prevailing legislation and guidance, as amended, whether mentioned here or not. Where legislation and documents are summarised this is for general advice and convenience, and must not be relied upon as a comprehensive or authoritative interpretation. Ultimately it is the responsibility of the person/company involved in the development or assessment of land to apply up-to-date working practices to determine the contamination status of a site and the remediation and verification requirements.

Acknowledgments

YALPAG would like to thank North Lincolnshire Council, Leeds City Council, City of Bradford Metropolitan District Council, Barnsley Metropolitan Borough Council, Rotherham Metropolitan Borough Council, Wakefield Council, and Tameside Metropolitan Borough Council, for producing this guidance.

YALPAG would also like to acknowledge Liverpool City Council's Contaminated Land Team, Coopers Consulting Engineers for allowing us to use their guidance document and photographs and WSP Environmental Ltd for also donating photographs.

Consultation

39 Local Authorities and 6 Environmental Consultants were consulted over a four week period in 2010 during the production of the initial guidance. At that time, consultation comments were considered by the review panel and a number of revisions were made to the guidance to reflect these comments.

49 Local Authorities and 25 Environmental Consultants were consulted in 2021, during the production of this version [4.1] of the guidance. Consultation comments were considered by the review panel and a number of revisions were made to the guidance to reflect these comments.

Introduction

This guidance has been produced to help developers ensure that they can demonstrate that material brought onto a development site for gardens or areas of soft landscaping are suitable for use and do not present harm to people, the environment and/or property. It is intended to improve the quality of reports submitted to Local Authorities on this matter and to give contractors/consultants a point of reference to obtain approval for such work from their client. This guidance does not cover the geotechnical suitability of soils or materials, chemical suitability that does not affect human health e.g. sulphates, or importing soils contaminated with invasive (or injurious) plants.

The verification of cover systems should be an integral part of the remediation project and agreed between developers and regulators at an early stage in the project.

UK guidelines for remediation verification are set out within Land Contamination Risk Management[1] (LCRM) and the document on Verification of Remediation of Land Contamination[2]. This guidance note should be considered as supplementary advice in conjunction with these documents.

This guidance relates to the remediation of land contamination by using cover systems; however, the verification of the quality of imported material is equally important in other situations, such as raising levels for flood prevention or general landscaping works. This guidance could also be used in such instances.

The Process of Verification

Implementation plans for remedial works should always be site specific. Where a cover system and potentially, excavation, is the main remedial method or a component of an overall site remediation, specific goals will need to be set that are linked directly to the risk management strategy for the site in question.

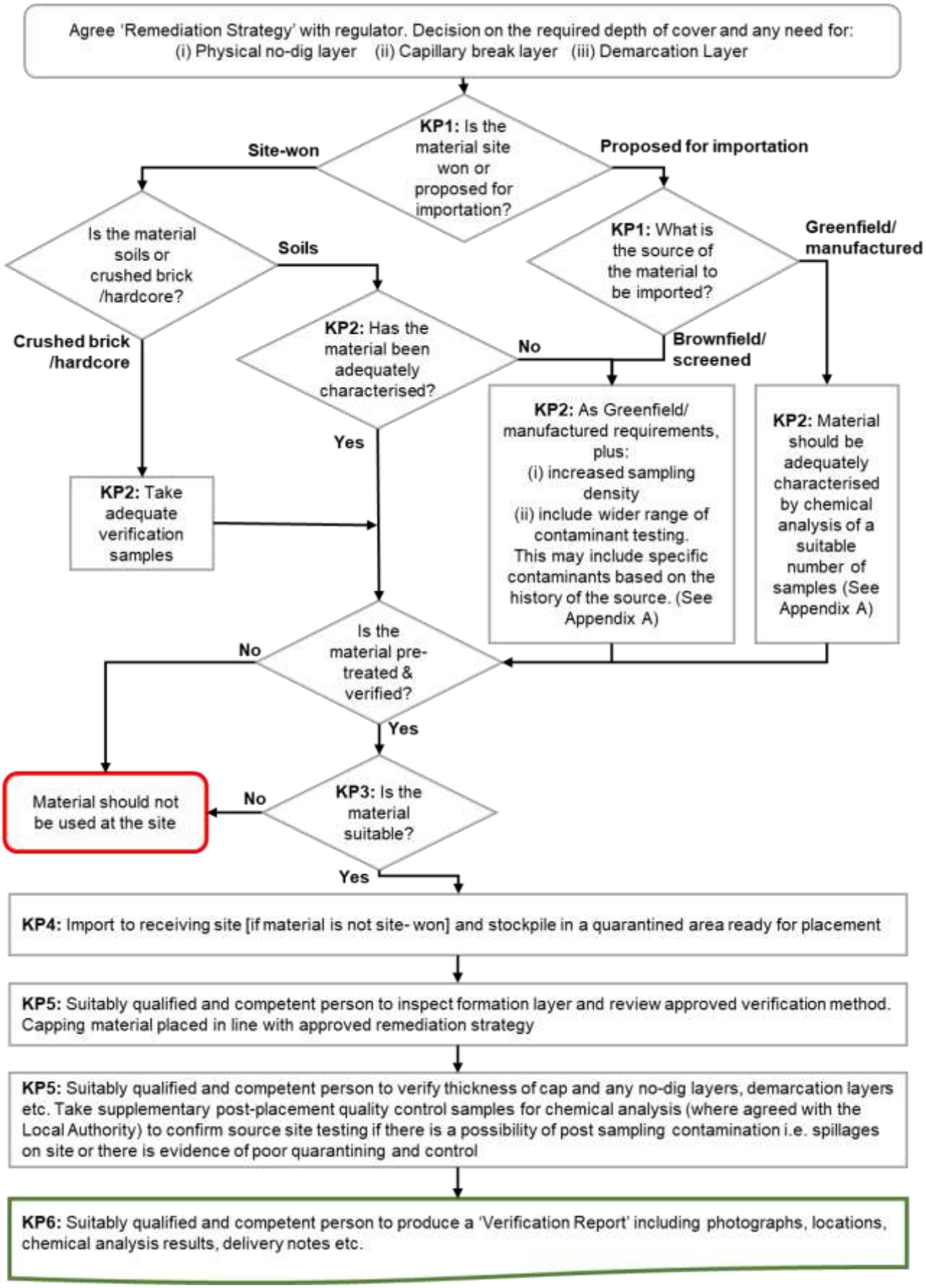
For cover and containment systems, verification will normally depend upon the provision of defensible measurements, observations and records. Critical factors to be considered are:

- What should be measured?
- When should they be measured?
- Where measurements need to be taken, what is the appropriate monitoring regime i.e. number and frequency of samples?
- Statistical constraints on sampling.

National Planning Policy Framework (NPPF) states that “planning policies and decisions should ensure that after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990”. The Verification Report is a key document to demonstrate compliance with NPPF, and the responsibility rests with the developer/applicant to submit the required Verification Report to complete the remediation and to discharge any planning conditions.

[1] Land Contamination Risk Management, Environment Agency, Oct 2020
[2] Verification of Remediation of Land Contamination. Environment Agency, Feb 2010

Overview Flowchart



Key Points

KP1: Source of Material

Material can be sourced from site won material i.e. crushed brick/hardcore or site-won soils from existing open or landscaped areas. In the interest of sustainability, Local Authorities promote the use of such site-won material providing that they are suitable for the intended end use of the site.

Alternatively, material can be sourced from other developments and commercial companies. Dependent on the source of the material it can be classified as either from a 'Greenfield/Manufactured' or 'Brownfield/Screened' source.

Broadly speaking material can be classified as follows:

Greenfield – Where documentary evidence is provided confirming that the source site has not been developed and that no past contaminative uses have occurred. Should evidence not be provided or approved by the Local Authority, please note that the source would be expected to be assessed as though it were a brownfield source.

Manufactured – from a commercial company who manufacture material by mixing or blending mineral soils (subsoil or sand) with an organic amendment (compost). If other soil component sources are used, documentary evidence should be provided confirming that the source site has not been developed and that no past contaminative uses have occurred. Should documentary evidence not be provided or approved by the Local Authority, please note that the source would be expected to be assessed as though it were a brownfield source.

Brownfield – material from a donor site that has previously been developed

Screened – material from a company who deal with skip/demolition waste which is screened for unsuitable material i.e. bricks, wood, plastic etc.

KP2: Characterisation of Material

It is essential that material is suitable for its intended use. Documentary evidence of the source of the material should be provided to the Local Authority. This may include desk study or site investigation reports. A defensible method is required to ensure the verification proposals are site specific and that the level of sampling reflects the need to ensure that imported material are suitable for their intended use.

Due to the diminishing supply of suitable Greenfield topsoil sources it has been found that the chemical quality of Greenfield sources is less reliable in certain areas. As a result the recommended analytical rate for the intended use of the development may vary between Local Authorities [see **Appendix 1a**].

When should this be done?

Sampling of material should be undertaken as early as possible i.e. prior to placement [for site won material] and prior to importation [for imported material]. This is to avoid the costly exercise of re-excavating unsuitable material and the possibility of cross contamination. Where the assessor has confidence that the material is of sufficient quality (i.e. tested by supplier, used previously) it is acceptable to test the material on site. Although, if it is deemed unsuitable it would have to be either removed off site or pre-treated at the cost and time of the developer. It is recommended that some verification samples are also taken once this material has been delivered to site to confirm suitability for use. Soils can become contaminated during transportation or when stockpiled on site.

What about certificates from commercial suppliers?

Where the material is provided by a commercial company, certificates or other industry Quality Protocol compliance i.e. WRAP, DoWCoP, will normally be accepted. This is on the proviso that it: (i) relates to the actual material being imported to the site and the type and amount of analysis is in line with what is prescribed in Appendix 1a; and, (ii) the certificates are less than two months old.

It is recommended that some additional verification samples are taken once this material has been delivered to site. Soils can become contaminated during transportation or when stockpiled on site.

Extreme caution should be given to importing material that has been recycled from demolition or skip waste as they could easily be contaminated e.g. asbestos containing materials. Please refer to "questions you should be asking your supplier" in **Appendix 1b** and include the responses in your report.

British Standard

Imported soils should be as specified in BS 3882:2015 for topsoil and BS8601:2013 for subsoil as 'suitable for their intended purpose'. Both British Standards relate mostly to nutrient content of topsoil and phytotoxic contamination and they do not consider contaminants that pose a risk specifically to human health. Soils should be tested for contaminants that are considered to pose a risk to human health in addition to those specified in the relevant British Standards to ensure that they are suitable for their intended use.

Initial screening

A visual / olfactory inspection of the material should be carried out by a suitably qualified and competent person to ensure that:

- It is a suitable growing medium;
- It is free from obvious contamination i.e. staining/free product etc.;
- It has not come from areas where Japanese Knotweed or other invasive or injurious plants, as specified by the Environment Agency, are suspected to have been growing;
- It is not odorous (could be considered a statutory nuisance);
- It is free from unsuitable material i.e. bricks, brick ties, timber and glass etc.); and,
- There are no visible signs of asbestos containing material (ACMs).

Testing schedule & number of samples

Chemical testing will normally be required on any materials that are to be used as cover material, even where this includes first generation quarried material. This should be carried out by a suitably qualified and competent person.

Appendix 1a explains in detail the sampling and testing requirements for a typical residential development. These are only guidelines and it may be necessary to deviate away from them depending on local and site-specific factors. It is recommended that the developer discusses any deviation with the Local Authority.

The following criteria sets out the requirements for sampling and testing:

- **Virgin Quarried Material** sampling needs to be 1 or 2 samples depending on the type of stone utilised, to confirm the inert nature of the material. Testing to include standard metals/metalloids (should include as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn).

- **Crushed Hardcore, Stone, Brick (excluding asphalt)** a minimum of 1 sample per 500m^3. Testing to include standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, total TPH. Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).

- **Greenfield/ Manufactured Soils** a minimum of 3 samples or, dependent on source and receptor, between 1 per 50m^3 and 1 per 250m^3. Testing to include standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, pH and soil organic matter (SOM) (or calculated from total organic carbon (TOC)).

- **Brownfield/ Screened Soils** a minimum of 6 samples or dependent on source and receptor, between 1 per 50m^3 and 1 per 100m^3. Standard metals/ metalloids (as above), PAH (16 USEPA speciation), TPH (CWG banded), asbestos, pH and SOM (or calculated from TOC). Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).

The assessment criteria need to be UK based, e.g. LQM S4ULs, Defra C4SLs or other similarly derived GACs.

KP3: Suitability of Material

Based on the characterisation of material above, the material should be either deemed suitable or unsuitable. Obviously unsuitable material should not be used (unless it is treated to reduce levels of contaminants below agreed target levels i.e. bioremediation – this would have to be agreed and included within the Remediation Strategy) and an alternative source of material should be sought by the developer. If the material is considered suitable it can be imported (if not site won) and stockpiled in a suitably quarantined area [refer to **KP4**].

KP4: Stockpiling & Quarantining of Material

It is essential that the 'suitable' material is either placed in its intended area straight away i.e. soft/landscaped areas or stockpiled in a suitable quarantine area to prevent on-site contamination.

In the event that an assessor finds material has been stored in an unsuitable area, samples should be taken to confirm that no cross contamination has occurred (including a visual/olfactory check of the material). The material should then be suitably quarantined or placed at its intended location immediately.

KP5: Verification of Required Depth

In line with the agreed Remediation Strategy, it is important to establish that the required depth has been achieved and is consistent across the site. There are two main ways to achieve this:

Depth testing in situ – small trial pit excavated to allow measurement of its depth by standardised tape measure or measuring staff.

Topographical surveys – accurate survey of the base and final formation layer height to establish the depth of cover.

Specific Local Authority Policy

Please check with the local Contaminated Land Officer to establish:

- Which type of method for testing depth is accepted; and,
- The number of verification areas per property, plot, landscaped area or garden area (some Local Authorities recommend at least 2 per plot for residential developments).

Important Note: Where demarcation, physical no-dig and capillary break layers exist they should be verified for their thickness and presence during the time of their installation. Details of the demarcation layer should be agreed with the Contaminated Land Officer prior to placement. This will include the design, type and strength of the geotextile separator or visual warning membrane. The verification of depth and confirmation of such layers should be carried out by a suitably qualified and competent person.

KP6: Reporting

The purpose of verification documentation is to provide transparent reasoning why the remediation was required, a methodology about how it was to be undertaken and proof that the specified works have been undertaken and to provide confirmation that the site is "suitable for its intended use".

The document is utilised not only to satisfy conditions of planning permissions but also is to be kept on record by the Local Authority should queries be raised during the lifetime of the development and to confirm to future purchasers that the site is suitable for use.

National Planning Policy Framework (NPPF) states that "planning policies and decisions should ensure that after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990". The Verification Report is a key document to demonstrate compliance with NPPF, and the responsibility rests with the developer/applicant to submit the required Verification Report to complete the remediation and to discharge any planning conditions.

It is also essential that other supporting documentation is included within a report carried out by a suitably qualified and competent person e.g. laboratory analysis results, delivery tickets for material, certificates for imported material (or if unavailable, documented evidence of the source of the Greenfield material), trial pit logs etc. A checklist has been included in **Appendix 2** to give an idea on what information should be recorded.

Additionally, any reporting should include details of any measures required to maintain the cover system integrity in the future e.g. successive construction phases (management plans) and longer term (restrictive covenants on title deeds).

Photographic evidence for validating the depth of cover

The Local Authority ideally would recommend the following programme of photographs to be taken of the placement of inert cover:

- Photographs of any stockpiles and quarantine areas
- Proof that the depth of inert cover has been installed
- Proof of the quality of the material to be used as inert cover
- Proof there is a geotextile separator and visual warning membranes if used between the underlying material and suitable for use soils.
- Proof of the method of placement and different layers if appropriate
- Proof of the completed project
- Inclusion of background features which will aid locating the photograph
- Inclusion of site identification boards within the photos which show the date, position taken i.e. corner of plot 3 and the site name.
- Inclusion of photographs of site stockpiles and quarantine areas.

The presence of good quality photographs is essential to prove beyond doubt that the remediation has been done as specified both by method and position, and that the images have been taken from the specific area stated.

Refer to **Appendix 3** for examples of good photographic evidence.

Appendix 1a – Sampling & Testing Matrix

Type	Number of Samples	Testing Schedule	Assessment Criteria
	Please note that these guidelines apply to a typical residential development, and relaxation of the guidelines or more stringent requirements may apply dependent on local and site specific factors. Therefore, <u>all parameters need to be agreed with the Local Authority</u>.		
Virgin Quarried Material	1 or 2 depending on the type of stone utilised, to confirm the inert nature of the material.	Standard metals/metalloids (should include as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn)	The assessment criteria need to be UK based, e.g. LQM S4ULs, Defra C4SLs or other similarly derived GACs.
Crushed Hardcore, Stone, Brick (excluding asphalt)	Minimum 1 per 500m^3	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, total TPH. Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).	
Greenfield/ Manufactured Soils	Minimum 3 Dependent on source and receptor, between 1 per 50m^3 and 1 per 250m^3	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, pH and soil organic matter (SOM) (or calculated from total organic carbon (TOC)).	
Brownfield/ Screened Soils	Minimum 6 Dependent on source and receptor, between 1 per 50m^3 and 1 per 100m^3	Standard metals/ metalloids (as above), PAH (16 USEPA speciation), TPH (CWG banded), asbestos, pH and SOM (or calculated from TOC). Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).	

Appendix 1b – Questions to Ask Your Soil Supplier Relating to Soil Quality

- What is the source of the material (refer to KP1)? If the source is Greenfield, can they provide evidence of this?
- Will all of the material be coming from the same source?
- Are you satisfied that the material is a suitable growing medium for the proposed end use?
- Has the supplier used an appropriate sampling protocol to ensure a representative sample is analysed? What volume of soil is represented by the analysis and does it comply with Appendix 1a?
- Does the testing include analysis of contaminants identified in Appendix 1a?
- Does the laboratory conducting the analysis have UKAS and MCERTS accreditation for the tests they are carrying out?
- Does the material comply with relevant waste regulations?
- Can I have a copy of the whole analysts report and does it include an interpretive section?
- Will the provided certificate be dated within the last 2 months?

Appendix 2 – Checklist for Verification Reports

Example only. Not to be considered as typical minimum requirements. Additional information should be included for non-cover systems aspects of the remediation i.e. gas protection measures etc.

Site Details	
Site Name / location	
Developer name	
Development use	
Plot No / description of landscaped area (inc plan of inspection areas)	
National Grid Reference	
Inspection visit date	
Supporting Evidence	
Description of remediation (as per agreed Remediation Method Statement including depths / thickness checks, topographical readings)	
Material tracking information (including way tickets etc.)	
Name of groundwork's remediation contractor	
Name of supervising environmental consultant	
Site Specific chemical analysis results	
Verification Photographs (inc. remarks)	
Recommendations	
Pass/fail	
If material fails, how will this be managed i.e. removed, treated	
Detail any further remedial works and/or inspection	
Signed off	

Failure to provide any of the above information may prevent planning conditions from being discharged.

Appendix 3 – Examples of Good Quality Photographs

© Coopers Consulting Engineers

Photograph 1:
Depth check of inert cover within area of public open space. Physical break layer and topsoil visible.

© WSP

Photograph 2:
Depth check of inert cover with Site & Location Information Board.

© Coopers Consulting Engineers

Photograph 3:
Depth check of inert cover within areas of front gardens.

© Coopers Consulting Engineers

Photograph 4:
Depth check of inert cover within areas of front gardens.

© Coopers Consulting Engineers

Photograph 5:
Depth check of inert cover within rear gardens. Taut string line spans across excavation.

© Coopers Consulting Engineers

Photograph 6:
Depth check of inert cover within rear gardens. Taut string line spans across excavation.

© Coopers Consulting Engineers

Photograph 7:
Shows the spatial location of the verification pit.

© Coopers Consulting Engineers

Photograph 8: Excavation within public open space and verification pit showing the presence of a remediation break layer at the base, a crushed sandstone inert fill overlain by topsoil.

© Coopers Consulting Engineers

Photograph 9: Inert crushed sandstone being delivered. The spatial area of the remediation can be observed from these photographs (old terrace housing).

© Coopers Consulting Engineers

Photograph 10: Inert crushed sandstone being delivered with visible remediation break layer. The spatial area of the remediation can be observed from these photographs (traffic lights).

© Coopers Consulting Engineers

Photograph 11:
Shows the remediation of the rear garden, with a significant depth (1.0m) of inert cover. This photograph has been stitched to form a panoramic photograph and hence there is slight distortion

© Coopers Consulting Engineers

Photograph 12:
Shows the remediation of the rear garden, with a significant depth (1.0m) of inert cover. Remediation break layer visible at the base of the excavation.