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
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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		
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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.

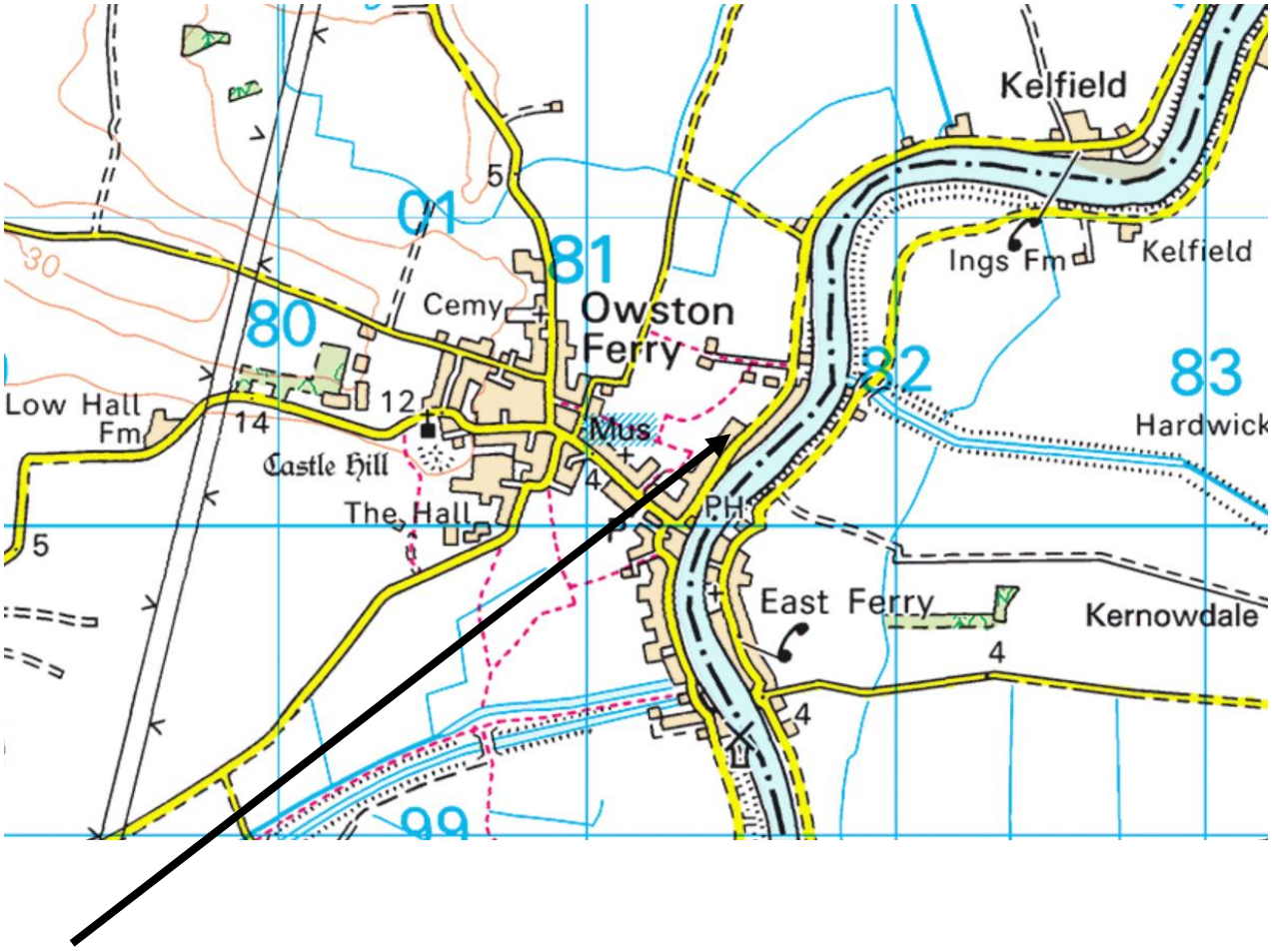
6.3 Regulatory Approval

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.

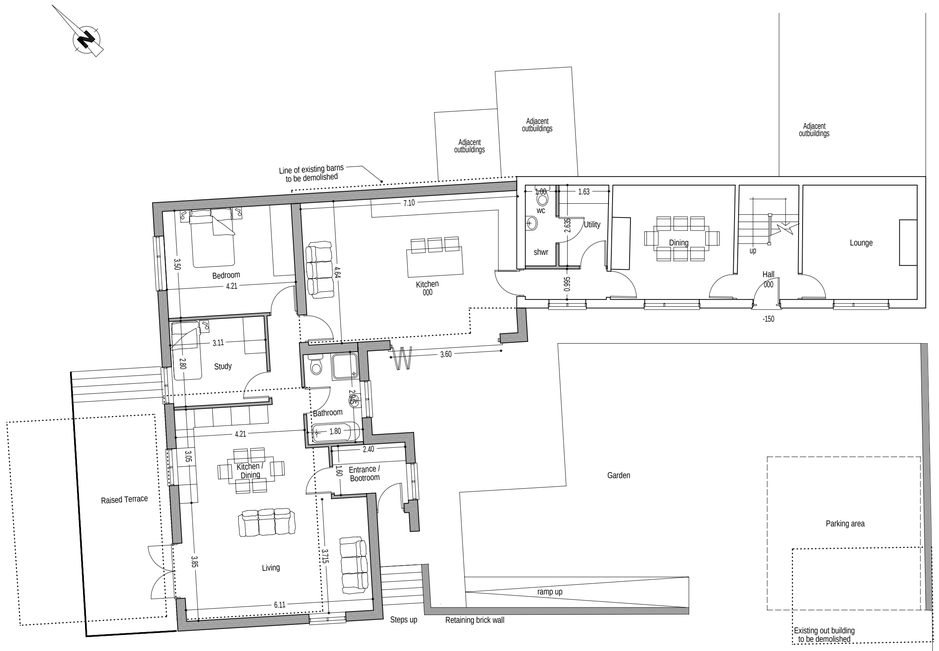
APPENDIX A

DRAWINGS



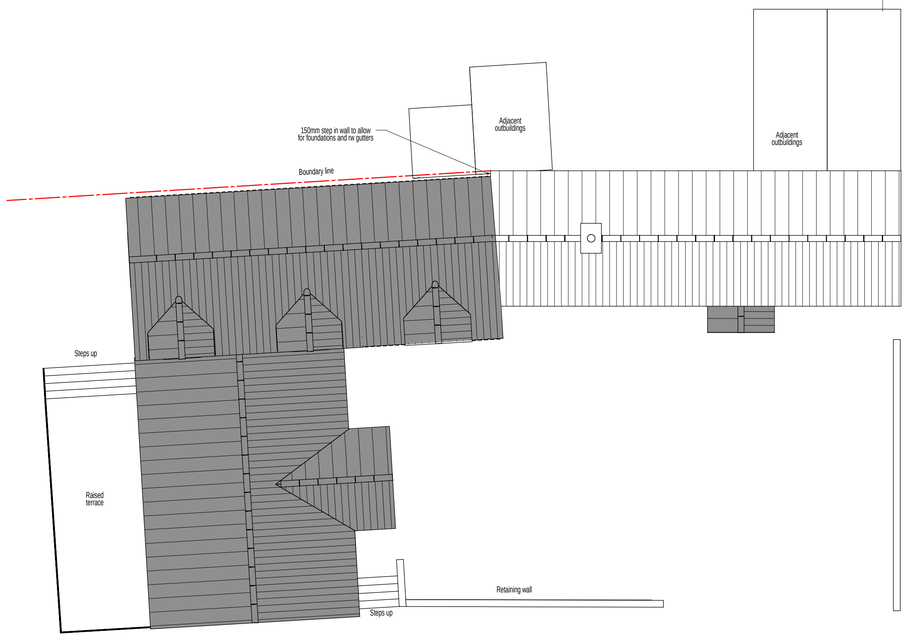
Site Location Plan **Drawing No C603/1/1**

G&M CONSULTING



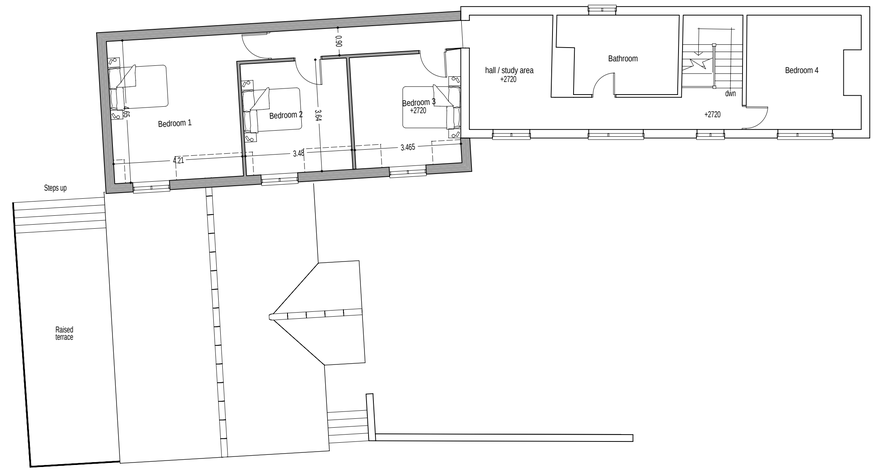
PROPOSED GROUND FLOOR PLAN
1:100

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

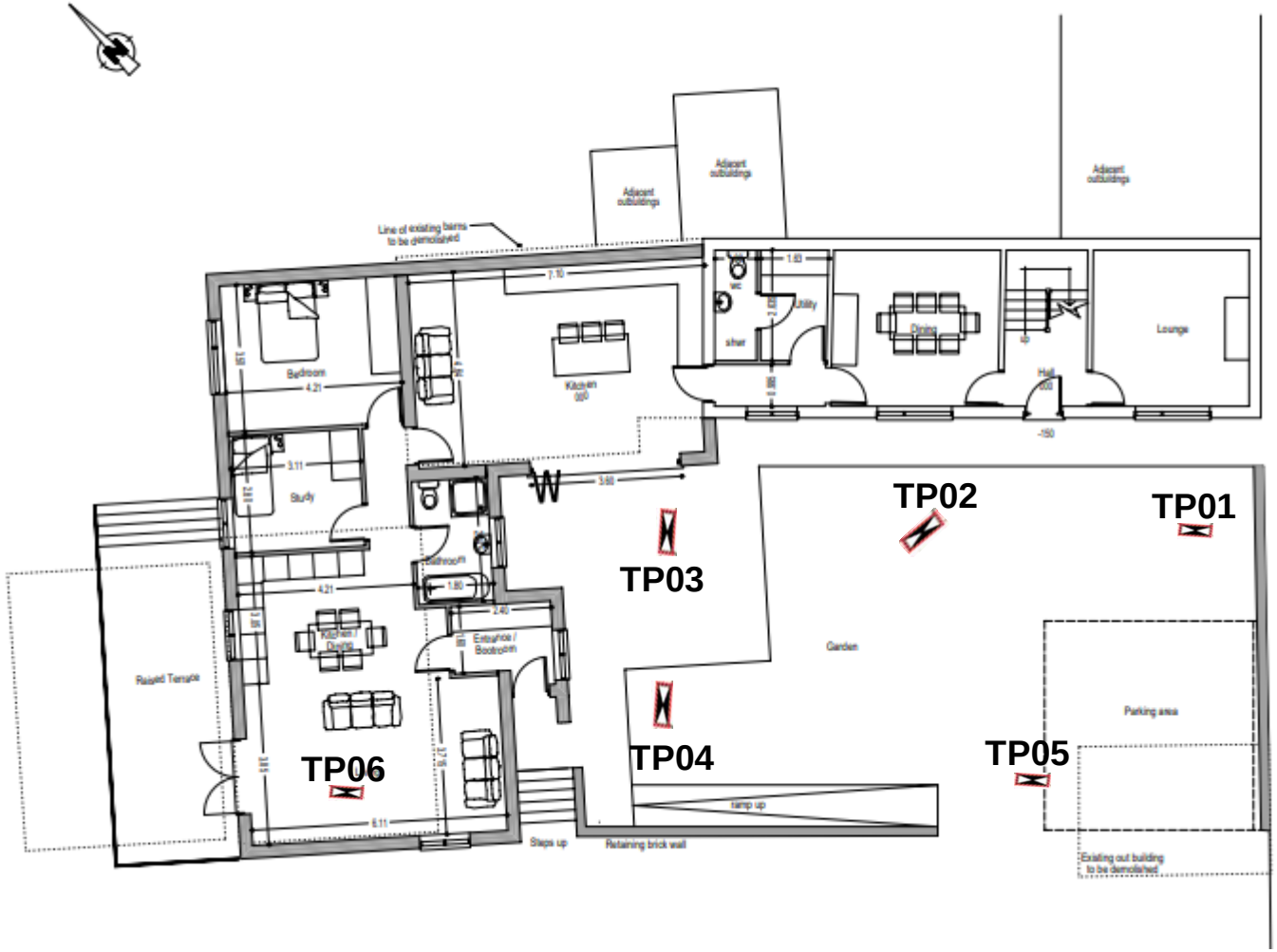
25 NORTH STREET
OWTSON FERRY

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			

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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

G&M CONSULTING

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

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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

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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

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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

t: [redacted]

e: [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

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* 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.

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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
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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).

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