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Directors:
G S J SOMMERWILL, BSc, MSc, CGeol, FGS, SILC, ROGEP Specialist
M R EYNON, BSc, MSc, CGeol, EurGeol, FGS, ROGEP Specialist

Associate Director:
D R BETTOSI, BSc, MSc, CGeol, CSci, FGS, ROGEP Professional
H G DAVIES, MEng, CGeol, FGS, RoGEP Professional
M T ELCOCK, BEng, CGeol, FGS, RoGEP Professional

Consultants:
J K C CAMPBELL, BSc, MSc, CEng, CGeol, FGS, FIMM

Earth Science Partnership
Consulting Engineers | Geologists | Environmental Scientists

33 Cardiff Road
Taff's Well
CARDIFF
CF15 7RB

TEL: (029) 2081 3385

www.earthsciencepartnership.com enquiries@earthsciencepartnership.com

Our Ref: 9254.02.4507
Your Ref:

Mr John Durkin

Friday, 19 December 2025

Rhyd Consult
103 Rhyd-Y-Penau Road
Cardiff
CF23 6PZ

BY EMAIL

Dear John,

**FORMER TUDOR INN, CAE RHYS DDU, CIMLA
PROPOSED HOUSING DEVELOPMENT – ADDITIONAL GEOENVIRONMENTAL INVESTIGATION**

Further to your recent instruction, we are pleased to provide the additional information and assessment for the new proposed housing development at the above site.

1.0 Introduction

1.1 Background

A new housing development is to be constructed at the above site and Earth Science Partnership (ESP) were instructed by Rhyd Consult, on behalf of Bluefield Land, who are developing the site for Tai Tarian to undertake a supplementary investigation and assessment in line with our emailed Proposal dated 20th January 2025. The site location is shown on Insert 2 in Section **Error! Reference source not found..**

Some previous assessments have been undertaken for a smaller site boundary, the orange shaded area in Insert 1 which will be referenced the Development Area in this additional assessment report, the current site boundary includes two residential properties on Beacons View to the north and part of the Beacons View highway, as shown by the red line boundary in Insert 1.

The existing and new road part of the site will be referred to as the Access Area of the site.

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Insert 1: Site Plan showing red line boundary of the wider site, made of the Development Area, shaded in orange and the Access Area to the northeast.

The proposed development will comprise conventional two-storey residential dwellings with private gardens, landscaping and estate roads. The proposed development layout is presented in Insert 1, and shows a large apartment block in the northwest, with link of three dwellings and seven further residential structures around a central northwest to south-east orientated estate road. A new access road for the development will be constructed from Beacons View to the northeast, created by the demolition of two existing properties. An infiltration basin (for SuDS) is shown just to the east of the new access.

ESP have previously undertaken a series of prior works comprising:

- Geotechnical and Geo-environmental Assessment Ref. 8398.3830 dated October 2024;
- Additional Soakaway Investigation Ref ESP.8398.02.4057 dated 22nd February 2024;
- Updated Coal Mining Risk Assessment Ref. 8398.03.4163 dated 11th November 2024;
- Additional Investigation ref. 8398.03.4230 dated December 2024; and
- Ground Gas Addendum Report Ref ESP.8398.03.4285 dated February 2025.

Whilst pertinent information is referred to and summarised within this report, our previous assessment should be referred to for full content and context as this document addresses only the requirements of the supplementary contamination assessment (see Section 1.2).

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ESP are also preparing another report for the site concentrating upon work to remediate the site from shallow mine hazards, this is not discussed in this report.

1.2 Objective and Scope of Works

This assessment comprises work in line with some of the recommendations made in our December 2024 report (Ref: ESP.8398.03.4230) and in line with our provided scope of works, this assessment addresses the following work items:

- Supplementary shallow trial pits and sampling;
- Specialist bio-accessibility (BARGE) testing; and
- Assessment and Reporting.

1.3 Limitations of Report

This report represents the findings of the brief relating to the proposed end use as detailed in Section 1.1 above. The brief did not require an assessment of the implications for any other end use or structures, nor is the report a comprehensive site characterisation and should not be construed as such. Should an alternative end use or structure be considered, the findings of the assessment should be re-examined relating to the new proposals.

Where preventative, ameliorative or remediation works are required, professional judgement will be used to make recommendations that satisfy the site-specific requirements in accordance with good practice guidance. Consultation with regulatory authorities will be required with respect to proposed works as there may be overriding regional or policy requirements which demand additional work to be undertaken. It should be noted that both regulations and their interpretation by statutory authorities are continually changing.

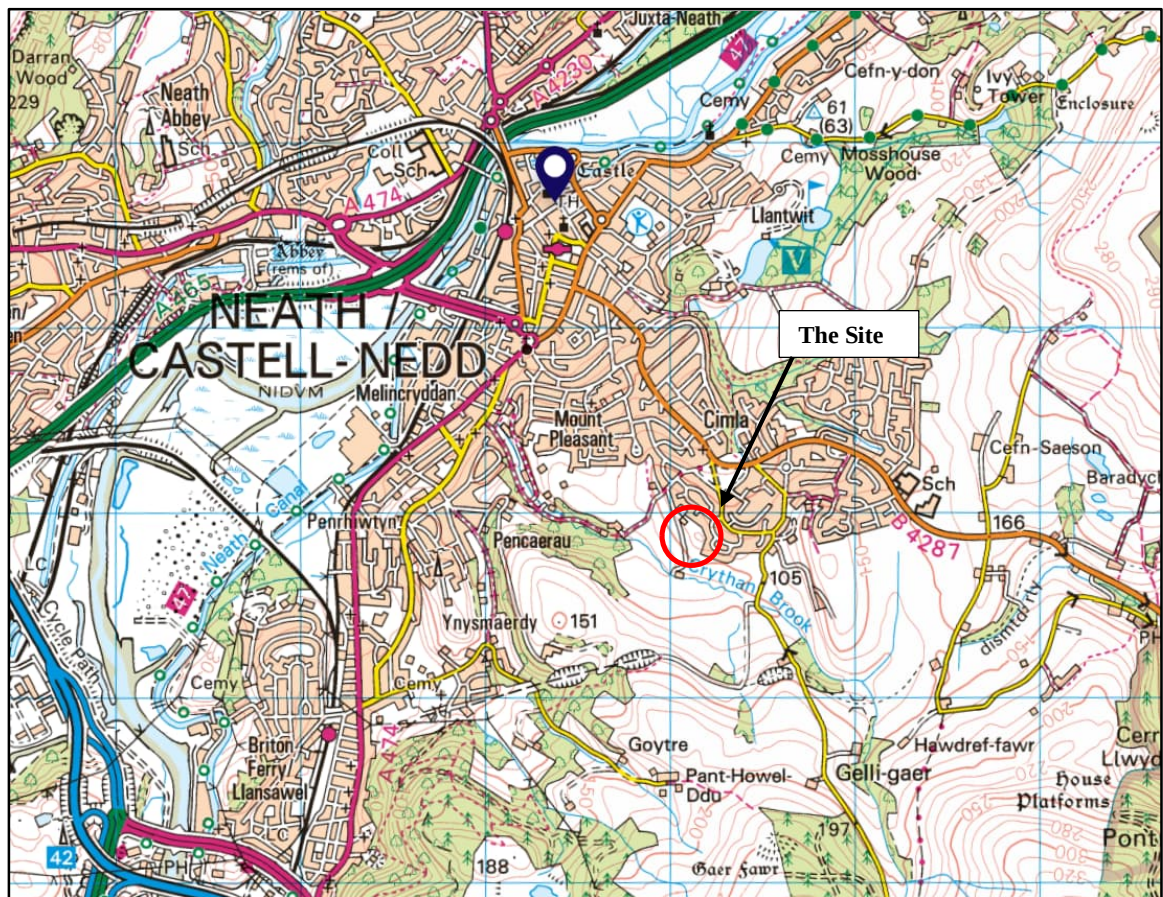
This report represents the findings and opinions of experienced geo-environmental and geotechnical specialists. Earth Science Partnership does not provide legal advice and the advice of lawyers may also be required.

2.0 Summary of Site Conditions

2.1 Site Location and Proposed Development

The proposed housing development is on the grounds of the former Tudor Inn, located on the south-western side of Cimla, Neath. The National Grid Reference of the centre of the site is (SS) 276060 196010 and the postcode is SA11 1JA. A Site Location Plan is presented as Insert 2 below.

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*Insert 2: Site Location Plan from Ordnance Survey 1:25,000 scale map.
Reproduced with permission (OS License No.: AL100015788).*

The site is irregular in shape, consisting in the main of a roughly rectangular area around 100m by 60m in size, with a narrow triangular extension running up to the site entrance on Cae Rhys Ddu Road in the north-western margins and an irregular shaped portion covering two residential properties off Beacons View in the north-east (see Insert 1). In total, the site is approximately 0.8 hectares in area.

The housing development will have areas of soft landscaping, private gardens and hardstanding. We understand that there will be no significant changes to the current ground levels.

2.2 Site History

The previous desk study for the site showed a suspected farm building, Cae Rhys Ddu, to have been on the site prior to the first map, dated 1881, buildings in the same location were called a 'club' and then the Tudor Inn. The Tudor Inn was apparently demolished in 2009.

The houses in the northern portion of the site, the Access Area were developed in the 1960s and this appears to be the only development in these areas.

2.3 Published Geology

The published geological map for the area of the site (1:10,560 scale, Sheet SS 79 NE) indicates the site to be underlain by sandstone bedrock of the Swansea Beds of the Upper Coal Measures. No superficial deposits are shown.

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An outcrop of 'false bedded flaggy sandstone' is indicated on the site, probably representing the sandstone exposure on the south-western boundary. The bedrock in the vicinity is shown to dip to the north-northeast at around 12 to 18° to the horizontal. The conjectural outcrop of the Graigola coal seam is shown to run broadly northwest-southeast some 20m to the west (downslope) of the site. Therefore, with a north-north-easterly dip, this seam would be anticipated to underlie the site at shallow depth.

3.0 Previous Intrusive Investigations

Earth Science Partnership (ESP) undertook a combined desk-based and exploratory investigation of the site in 2013 which included:

- a boundary condition report by 4M Development Services Ltd (2013).
- ten trial pits to depths of between 0.2 and 3.2m.
- three soakaway infiltration tests within three selected trial pits.
- three rotary open-hole boreholes to depths of between 21m and 30m.

In 2023 ESP reviewed and summarised the ESP 2013 investigation alongside a desk study report by Integral Geotechnique Wales Limited (2022) to provide a summary of the site conditions to updated assessment criteria and standards.

In 2024 additional soakaway testing was conducted by ESP and reported as a factual letter. Testing comprised of five trial pits with soakaway testing conducted in each.

ESP were subsequently instructed to undertake an additional phase of investigation, that comprised:

- The excavation of 12no. trial pits across the site
- Two hand dug trial pits in the northern portion of the site, within the Access Area.
- Two trial trenches on the southern boundary
- Nine rotary boreholes that mainly adopted open hole methods, however dynamic sampling and rotary coring methods were used to gain information to feed into the ground model.
- Installation and monitoring of nine gas and groundwater monitoring standpipes
- Geoenvironmental and geotechnical testing and assessment.

Previous investigation and testing, ESP 2013, showed that levels of contamination were generally low, except for a slightly elevated concentrations of dibenzo (a,h) anthracene near to where surface burning was noted in TP1.

Subsequent testing in our additional investigation found that samples of Made Ground tested showed elevated levels of arsenic, beryllium, benzo(a)anthracene benzo(a)pyrene, benzo(b)fluoranthene, chrysene and dibenzo(a,h)anthracene.

Except for arsenic in two of the four topsoil samples tested, the topsoil was showed no elevated concentrations of contaminants tested.

The sample of topsoil tested from the garden of the house in Access Area showed no elevated concentrations of contaminants above the residential GAC adopted.

Five samples of shallow soils, both Made Ground and Topsoil were tested for a range of hydrocarbons, the results show no concentrations above the adopted residential GAC.

The demolition rubble from the former Tudor Inn contained what was visual assessed as asbestos. To understand if asbestos had spread across the site, some 30 samples of asbestos were screened across the site and no asbestos fibres were identified within any of the shallow soil samples tested; of topsoil and Made Ground.

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Suspected asbestos cement sheeting in the demolition stockpile was confirmed as Asbestos. The bitumen felting thought to visually contain asbestos was confirmed not to contain asbestos.

4.0 Supplementary Investigation

4.1 Scope of Investigation

Supplementary sampling and testing of shallow soils was scoped to obtain representative samples of shallow soils across the entire Development Area.

4.2 Trial Pits

20no. additional trial pits (TP301 to TP320) were excavated across the site on the 2nd of October 2025 using a mechanical excavator. The trial pits were excavated to a maximum depth of 0.65m in areas of proposed soft landscaping to obtain disturbed samples of shallow soils for geo-environmental testing.

The trial pit records are presented as Enclosures A, and their positions are shown on Figure 1.

On completion, the trial pits were backfilled with arisings in layers compacted and the Topsoil reinstated on the surface.

4.3 Stockpile Sampling

In addition to the shallow trial pits above, some topsoil had been scraped and stored in an area of the site following ecological clearance works. Three trial pits were excavated into the stockpile to confirm the material variability and to enable three samples to be collected.

The location of the stockpile is shown on Figure 1 and the logs are provided in Enclosures B.

4.4 Geo-environmental Sampling and Testing

A regular spaced grid was used across the Development Area to collect samples from the shallow soils. Environmental samples (denoted as ES on the investigation points records) were collected for possible geo-environmental laboratory testing and generally comprised a plastic tub, an amber glass jar and an amber glass vial. The sample containers provided clean by the testing laboratory appropriate for the proposed testing to be scheduled. Immediately after collection the samples were placed in sealed cool boxes with ice packs where they remained during storage and transport to the laboratory.

Made Ground was encountered in the central western, southern and northern edges area of the Development Area, generally as anticipated and as encountered previously.

No other direct visual/olfactory evidence of contamination was identified in the topsoil across much of the site.

At the time of the investigation, some topsoil had been stockpiled whilst ecology clearance was undertaken and three representative environmental samples from the stockpile were collected for testing.

The desk study and previous phases of work at the site suggested that there were no obvious sources of contamination in the topsoil, however several contaminants in the Made Ground. Previous topsoil testing indicated elevated arsenic.

Where Made Ground was encountered, they were tested for a wide range of contaminants and leachate analysis.

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The marginal exceedance of arsenic in the topsoil presents a possible risk to end users. To further the human health risk assessment for arsenic, testing for the bio-accessible fraction has been undertaken during the supplementary works using the Unified BARGE method (UBM) created by the Bio-accessibility Research Group of Europe. Two samples of the shallow soils have been selected and tested.

The test is an in-vitro (artificial, non-animal) method designed to model the simulate the human digestive system using synthetic versions of the fluids present within the digestive tract, e.g. saliva, gastric fluids, duodenal fluid, and bile. The results provide the concentration and percentage of a contaminant likely to be taken up in the stomach (gastric) and intestines (gastro-intestinal). The BARGE testing results are presented in Enclosure C.

5.0 Conceptual Ground Model

5.1 Ground Conditions

The additional trial pits generally encountered the expected ground conditions, although some other areas of Made Ground were noted, it did not alter the previously reported ground model. For completeness, a summary of the working ground model is presented below, which is based upon all previous phases of work at the site.

Made Ground – near Tudor Inn and northern boundary: encountered to a maximum depth of 0.8m around the Former Tudor Inn and hardstanding areas as what are likely to be ‘sub-base’ gravels or dark brown gravelly sandy silts and clays with fragments of brick, ash, glass, concrete and plastic or re-worked topsoil.

Made Ground – along western boundary: thicker, with depths in excess of 3.2m, typically as heterogeneous sandy, clayey gravel with fill and tip material.

Topsoil: encountered in the field away from the Tudor Inn and hardstanding area to a maximum depth of 0.5m.

Swansea Member - Pennant Sandstone Formation: encountered at shallow depth across site beneath the topsoil or Made Ground. Typically comprising a weathered horizon of soft orange-brown slightly sandy gravelly clay or a sandy gravel or cobble of sandstone to a maximum encountered depth of 1.6m. Below the relatively thin weathered horizons, competent bedrock was encountered, typically comprising the Sandstone. A coal seam with several leaves was identified at the base of the sandstone which was noted to have evidence of being worked/mined.

Hughes Member - Pennant Sandstone Formation

Below the coal seam, thought to be the Graigola coal seam, the boreholes encountered mudstone which is likely to be of the Hughes Member.

The coal seam was encountered between depths of 4.0m (RO1) and 17.6m (RO206) depth and was typically 1.5 to 2m in thickness, and likely dipping northeast.

5.2 Groundwater

The additional investigation did not encounter any groundwater; the previous investigation did not identify any groundwater to a depth of 19m. However, the investigation points were completed within one working day and the near-surface soils were fine-grained in nature. Due to the soils low permeability, it is possible that groundwater may be present within the depth of investigation, but there was insufficient time for it to be recorded.

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Based on the Conceptual Ground Model, we consider that the main groundwater body beneath the site is within the Pennant Sandstone Formation bedrock at depth. There may be perched pockets of water, notably near existing structures (the former Tudor Inn) or services and with Made Ground, particularly on the southwestern portion of the site.

5.3 Risks to Human Health

The assessment criteria used as part of this GQRA are presented on the tables in the following sections.

The proposed development comprises conventional residential properties with private gardens. Therefore, the GAC appropriate for the residential land use with plant uptake have been adopted in this assessment.

The GAC for most organic compounds are dependent on the organic content of the soil. For the purposes of this assessment, GAC for a soil organic content of 1% has been adopted.

5.3.1 Generic Quantitative Risk Assessment

This assessment is split up to consider the different soils at the site, the Made Ground and the Topsoil.

It should be appreciated that if the development were to change, the following assessment should be reviewed and, if necessary, updated.

Asbestos

Asbestos was previously visually identified in the demolition rubble on site which was in the location of the former Tudor Inn building.

Previous investigations, which included screening for asbestos in 30no. shallow trial pits across the site did not identify obvious visual asbestos fragments and the 30no. samples screened did not identify asbestos.

All the samples of Made Ground were screened for asbestos in the lab and one of the five (TP320) samples received a positive identification for chrysotile present as fibre bundles. The material in TP320 the asbestos was noted within was a hardcore material, comprising a gravel below a hardstanding area.

Quantification of the asbestos indicated a total mass of 0.007%.

Made Ground

Using data from this investigation, and the previous phase, eight samples of made ground have been tested in total and the results are presented in Table 1.

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Table 1 - Generic Assessment of Human Health Risks (Residential with Plant Uptake) for Made Ground

Determinand	Minimum Recorded (mg/kg)	Maximum Recorded (mg/kg)	GAC (mg/kg)	Source of GAC	Exceedances
Metals and Semi-metals					
Arsenic	11	42	37	C4SL ²	2 of 8
Beryllium	0.4	1.8	1.7	S4UL ⁴	1 of 8
Boron	0.2	0.6	290	S4UL ⁴	None of 8
Cadmium	0.2	1.2	22	C4SL ²	None of 8
Chromium (total) ⁵	12	130	910	S4UL ⁴	None of 8
Chromium (hexavalent)	< 1	< 1	21	C4SL ²	None of 8
Copper	54	140	2,400	S4UL ⁴	None of 8
Lead	54	200	200	C4SL ²	None of 8
Mercury ⁶	< 0.05	0.22	40	S4UL ⁴	None of 8
Nickel	9.2	59	130	S4UL ⁴	None of 8
Selenium	<0.5	1.9	250	S4UL ⁴	None of 8
Vanadium	23	82	410	S4UL ⁴	None of 8
Zinc	200	1500	3,700	S4UL ⁴	None of 8
Polyaromatic Hydrocarbons (PAH)					
Acenaphthene	< 0.03	< 2	210	S4UL ^{4,7}	None of 8
Acenaphthylene	< 0.03	< 2	170	S4UL ^{4,7}	None of 8
Anthracene	0.05	< 2	2,400	S4UL ^{4,7}	None of 8
Benzo(a)anthracene	0.31	17	7.2	S4UL ^{4,7}	1 of 8
Benzo(a)pyrene	0.34	37	5.0	C4SL ^{2,7}	2 of 8
Benzo(b)fluoranthene	0.06	41	2.6	S4UL ^{4,7}	3 of 8
Benzo(ghi)perylene	0.16	21	320	S4UL ^{4,7}	None of 8
Benzo(k)fluoranthene	0.2	11	77	S4UL ^{4,7}	None of 8
Chrysene	0.46	23	15	S4UL ^{4,7}	1 of 8
Dibenzo(a,h)anthracene	0.04	6	0.24	S4UL ^{4,7}	4 of 8
Fluoranthene	0.93	16	280	S4UL ^{4,7}	None of 8
Fluorene	< 0.03	<2	170	S4UL ^{4,7}	None of 8
Indeno(123-cd)pyrene	0.17	17	27	S4UL ^{4,7}	None of 8
Naphthalene	< 0.03	<2	2.3	S4UL ^{4,7}	None of 8
Phenanthrene	0.35	5.1	95	S4UL ^{4,7}	None of 8
Pyrene	0.77	13	620	S4UL ^{4,7}	None of 8
BTEX Compounds					
Benzene	< 0.01	< 0.01	0.87	C4SL ^{2,7}	None of 2
Toluene	< 0.01	< 0.01	130	S4UL ^{4,7}	None of 2
Ethyl benzene	< 0.01	< 0.01	47	S4UL ^{4,7}	None of 2
Xylene ⁷	< 0.01	< 0.01	56	S4UL ^{4,7}	None of 2
Aliphatic Petroleum Hydrocarbons (Equivalent Carbon Number)					
Ali EC 5-6	< 0.01	< 0.01	42	S4UL ^{4,7}	None of 2
Ali EC 6-8	< 0.01	< 0.01	100		None of 2
Ali EC 8-10	< 0.01	< 0.01	27		None of 2
Ali EC 10-12	< 1.5	< 1.5	130*		None of 2
Ali EC 12-16	< 1.2	< 1.2	1,100*		None of 2
Ali EC 16-35	< 4.9	213	65,000*		None of 2
Aromatic Petroleum Hydrocarbons (Equivalent Carbon Number)					
Aro EC 5-7	< 0.01	< 0.01	70	S4UL ^{4,7}	None of 2
Aro EC 7-8	< 0.01	< 0.01	130		None of 2
Aro EC 8-10	< 0.01	< 0.01	34		None of 2
Aro EC 10-12	< 0.9	< 0.9	74		None of 2
Aro EC 12-16	< 0.5	< 0.5	140		None of 2

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Aro EC 16-21	< 0.6	14	260		None of 2
Aro EC 21-35	< 1.4	390	1,100		None of 2
Other Organic Compounds					
Phenol	< 0.3	0.6	280	S4UL ^{4,7}	None of 8
Notes:					
1. Assessment for residential land use <u>with home-grown produce uptake</u> and Made Ground only.					
2. C4SL: Category 4 Screening Level, published by CL:AIRE.					
3. SGV: Soil Guideline Value published by Environment Agency.					
4. S4ULs Suitable 4 Use Levels. Copyright Land Quality Management Limited, reproduced with permission; Publication No. S4UL3156. All Rights Reserved.					
5. In the absence of Chromium VI, all chromium present likely to be Chromium III. GAC for Chromium III adopted.					
6. GAC for inorganic mercury adopted.					
7. GAC for organic compounds based on 1% soil organic content.					
8. GAC for xylene based on p-xylene (lowest S4UL).					
9. Exceedances highlighted in red and bold.					
10. Results below the limit of detection mark with '<'. Limits of detection may vary where sample dilutions have occurred.					
11. Laboratory results presented in Enclosures C.					
* GAC exceeds solubility or vapour saturation limit.					

Topsoil

Previous investigation has shown that only arsenic is elevated in the Topsoil and Table 2 provides the previous and new test results for arsenic in the Topsoil.

Table 2 - Generic Assessment of Human Health Risks (Residential with Plant Uptake) for Topsoil

Determinand	Minimum Recorded (mg/kg)	Maximum Recorded (mg/kg)	GAC (mg/kg)	Source of GAC	Exceedances
Metals and Semi-metals					
Arsenic	21	61	37	C4SL ²	15 of 22
1. Assessment for residential land use <u>with home-grown produce uptake</u> and Made Ground only. 2. C4SL: Category 4 Screening Level, published by CL:AIRE. 3. S4ULs Suitable 4 Use Levels. Copyright Land Quality Management Limited, reproduced with permission; Publication No. S4UL3156. All Rights Reserved. 4. Exceedances highlighted in red and bold. 5. Laboratory results presented in Enclosures C.					

The Generic Acceptance Criteria assume that all the contaminants ingested into the body (intake) are then fully absorbed by the body and enter the bloodstream (uptake). However, this is commonly not the case, as the contaminants present are not always in a form which can be absorbed, with a proportion of the contaminant passing straight through the body. It is only the proportion that is absorbed by the body (i.e., the bio-accessible fraction) which can cause harm.

The bio-accessible fractions of arsenic within the Topsoil across the site have been measured using the BARGE method.

- The levels of bio-accessible gastric and gastrointestinal arsenic are between 3.1% and 3.5%.

The total bio-accessible fraction is the sum of the arsenic absorbed in the stomach and intestines. However, the test method uses two separate sub-samples in the test (one for the gastric test and one for the gastro-intestinal test). Therefore, the testing is not undertaken sequentially as occurs in the human body and a simple summation of the two values does not equate to the true bio-accessibility. However, as the gastro-intestinal test is based on soil ingested (and not having been through the stomach first), it is likely to include some arsenic which would have been absorbed in the stomach.

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Therefore, we consider that summing the two values provides an over-estimation of the true bio-accessibility, and therefore, is a conservative approach.

The bio-accessibility testing indicates that in general, a low fraction of arsenic is available for uptake into the human body. For the purposes of this assessment, we have adopted a conservative bio-accessible fraction of 3.5% for arsenic.

5.2.2 CLEA Model and Detailed Quantitative Risk Assessment

Based on the BARGE testing, revised site-specific assessment criteria (SSAC) for arsenic have been generated using the exposure and toxicological assumptions within the CLEA model. Both oral and inhalation exposure routes have been considered to calculate a combined SSAC.

Based on the total bio-accessible fraction of 3.5% (the worst case determined in the testing), a revised combined SSAC (oral and inhalation) for arsenic of 1,664mg/kg has been calculated. The CLEA outputs are presented in Enclosures D.

5.3 Risks to Controlled Waters – Leachates

To allow an initial assessment of the potential pollution risks to controlled waters, samples of leachate have been generated from five samples of Made Ground. The leachate preparation was carried out in accordance with BS EN 12457, at a 10:1 eluate ratio. The results of the leachate testing and their comparison to the relevant assessment criteria are presented in Table 3 below, based on the River Neath as the most vulnerable receptor, however the risks to general groundwater are also considered, as per Table 4.

Table 3 – Controlled Waters Risk Assessment – Leachate Results – River Neath

Compound	Range Recorded		EQS - AA	Exceedances
	Min (µg/l)	Max (µg/l)		
Metals and Semi-metals:				
Arsenic ¹	3.8	9.1	50µg/l	None of 5
Cadmium ^{2,4}	<0.03	0.05	0.08µg/l	None of 5
Chromium ^{2,5}	0.85	2.2	3.4µg/l	None of 5
Copper ²	4.7	8.2	1.0µg/l	5 of 5
Iron ³	190	660	1,000µg/l	None of 5
Lead ¹	3.5	22	1.2µg/l	5 of 5
Nickel ²	0.8	1.4	4.0µg/l	None of 5
Zinc ^{2,6}	14	21	13.7µg/l	5 of 5
Polyaromatic Hydrocarbons				
Anthracene ¹	<0.01	0.02	0.1µg/l	None of 5
Benzo[a]pyrene ¹	0.01	0.03	0.00017µg/l	5 of 5
Naphthalene ²	<0.05	<0.05	2.0µg/l	None of 5
Fluoranthene ¹	0.02	0.03	0.0063µg/l	5 of 5
Other Contaminants				
Cyanide ²	<0.1	0.2	1.0µg/l	None of 5
Phenol ²	<1.5	2.1	7.7µg/l	None of 5
Notes:				
1. Hazardous substance (JAGDAG, 2019).				
2. Non-hazardous substance (JAGDAG, 2019).				
3. Iron not classified by JAGDAG 2019.				
4. EQS levels based on most stringent water hardness values.				
5. All chromium present assumed to be chromium VI (conservative approach).				
6. Zinc EQS based on ambient background concentration in River Neath catchment.				
7. EQS-AA – Environmental Quality Standard (freshwater/inland) - Annual Average or Mean.				
8. Exceedances indicated in bold and colour coded as shown.				

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Table 4: Controlled Waters Risk Assessment – Leachate Results – General Groundwater

Compound	Range Recorded		UKTAG ⁵	Exceedances
	Min (µg/l)	Max (µg/l)		
Metals				
Arsenic ¹	3.8	9.1	5.0µg/l	4 of 5
Chromium VI ^{1,3}	0.85	2.2	5.0µg/l	None of 5
Lead ¹	3.5	22	5.0µg/l	4 of 5
Mercury ¹	<0.01	0.01	0.5µg/l	None of 5
Polyaromatic Hydrocarbons				
Anthracene ¹	<0.01	0.02	0.05µg/l	None of 5
Benzo[a]pyrene ¹	0.01	0.03	0.005µg/l	5 of 5
BbF ¹	0.03	0.07	0.05µg/l	3 of 5
BghiP ¹	0.02	0.06	0.05µg/l	2 of 6
BkF ¹	0.01	0.04	0.05µg/l	None of 5
IDP ¹	0.02	0.07	0.05µg/l	2 of 5
Notes:				
1. Hazardous substance.				
2. Non-hazardous substance.				
3. All chromium present assumed to be chromium VI (conservative approach).				
4. Assessment based on non-potable groundwater beneath the site.				
5. UKTAG – UK TAG concentration below which the danger of deterioration in the groundwater quality is avoided.				
For hazardous substances only.				
6. Exceedances indicated in bold and colour coded as shown.				
Key to PAH compounds:				
BbF: benzo[b]fluoranthene			BkF: benzo[k]fluoranthene	
BghiP: benzo[ghi]perylene			IDP: indeno[123-cd]pyrene	

The leachate testing of samples of Made Ground has recorded metals and polyaromatic hydrocarbons which exceed surface water and groundwater assessment criteria.

6.0 Remedial Strategy for Contamination Risks

6.1 Introduction

This additional investigation considered the risks to end users from Topsoil and the Made Ground; it also assessed the risks to the site environs.

Previous phases of work, and this assessment has shown that the Topsoil across the site has elevated concentrations of arsenic. The exact source of the arsenic is unknown, however, given the site setting, south Wales and near heavily industrialised areas, it is possible that the arsenic present on site is a result of windblown contamination. There are no anthropogenic materials within the topsoil and the additional testing and BARGE analysis suggest that the levels of arsenic in the topsoil do not present a significant risk to end users.

Made ground is present in portions of the site and testing has shown elevated levels of metals and polyaromatic hydrocarbons. The contaminants are also leachable and present a risk to surface waters and groundwater. Further testing and analysis would be required if the Made Ground were to remain on site, or it could be removed as part of the remediation strategy.

The below recommendations superseded the recommendations in our ESP.8398.03.4230.

6.2 Site End Users

Superseded

6.2.1 Made Ground

The levels of arsenic, beryllium and several polyaromatic hydrocarbons in the Made Ground are elevated above the generic assessment criteria and, therefore, are present at unacceptable levels with respect to the users of the proposed residential development. Appropriate measures would need to be taken prior to development to break the pollutant linkage and mitigate these risks.

Leachate testing has indicated that the metals and polyaromatic hydrocarbons are leachable and present a possible risk to surface waters and groundwater. Whilst further testing and analysis (controlled waters risk assessment) could be undertaken to determine if these levels represent a likely risk to controlled waters a simple method of removing these risks would be to remove these soils from site and thus removing the source of the contamination.

If the further investigation and assessment option was selected, any Made Ground remaining on site would need to be placed under hard surfacing i.e. not in areas of soft landscaping or gardens. There would normally be an option to place the material at depth, but this is unlikely to be favourable at this site given the shallow depth of bedrock.

6.2.2 Topsoil

The investigations have shown elevated concentrations of arsenic in the Topsoil. The source of the arsenic in the topsoil is unknown but given the industrial heritage of the surrounding area it is possible that it originates from wind blown debris and is present in the natural topsoil. A single elevated concentration of dibenzo(a,h)anthracene was noted in a sample taken near an area of surface burning.

Further detailed assessment allowed a site-specific assessment criteria (SSAC) for arsenic to be generated, based upon the site measured bioavailability of arsenic. The highest value of arsenic recorded in the Topsoil is 61 mg/kg, which is below the SSAC generated, which is 1,664mg/kg.

On this basis, the topsoil could be used on site as part of the development in areas of soft landscaping and gardens.

The area of surface burning should be removed from site. The chosen contractor should carefully remove and store the topsoil until needed for development and this process should be detailed in a Remediation Strategy.

6.3 Asbestos

Previous phases of investigation showed asbestos in a demolition rubble pile in the location of the former Tudor Inn building. No asbestos was identified in surrounding shallow soils across the site.

A sample of chrysotile asbestos was encountered in TP320 within the made ground, likely to be hard core. As discussed in Section 6.2.1, there are different options for the Made Ground as it also contains elevated levels of metal and polyaromatic hydrocarbon contamination. Due to this it will either need to be removed off site, or if acceptable by further testing and assessment, it will need to be placed below hard surfaced areas, such as tarmac. This process would also block the pathways of the asbestos to the end users and could be considered as an option if needed.

There is no clear UK guidance on what would constitute an acceptable concentration of asbestos in soil. Working with asbestos (even within soils) is governed by the Control of Asbestos Regulations (2012). This requires that the excavation and removal of the asbestos contaminated soils must be undertaken by a licensed contractor. Alternatively, an asbestos specialist may be employed to undertake further assessment of the risk from the asbestos present in the soils beneath the site with a view to investigating whether there would be an alternative risk mitigation method to prevent the expensive and non-sustainable removal and disposal of soils.

Superseded

The above and following sections presume that any risks from asbestos materials at the site are mitigated.

6.4 New Service Connections

The current water industry guidance for the suitability of pipe materials on potentially contaminated sites (Blackmore et al, 2010) has onerous requirements and it is likely/possible, based on this guidance, that the levels of contaminants on site may prevent the use of plastic pipework. We recommend that enquiries are made to the local water authority to confirm their requirements for underground service materials for this development.

6.5 Risk to Construction and Maintenance Workers

Short term (acute) risks to construction and maintenance workers are generally poorly understood within the industry, certainly when compared to the volume of research undertaken on long term risks. However, we anticipate that the levels of contamination at the site are not likely to pose a severe acute risk to construction workers or future maintenance workers. Ground workers would need to undertake their own assessment of the risks to their workers.

We recommend that construction workers adopt careful handling of the potential contaminants and good standards of personal hygiene should be adopted to reduce the risk of possible ingestion and skin contact should any hotspots be encountered. The contractor should comply with the appropriate current Health and Safety at work legislation.

6.6 General Public/Neighbouring Properties

Removal of the rubble pile which includes asbestos must be done in such a way as to avoid fibre release of asbestos to neighbouring properties.

For the soil contaminants noted, we do not anticipate any significant risks to the public from the development of the site. However, careful dust control measures should be adopted during construction to minimise the risk (and nuisance) to the public and neighbouring residents.

6.7 Risks to Controlled Waters

No specific assessment of the risks to controlled waters has been undertaken to date. However, the following points are considered salient.

- The desk study showed that the site lies approximately 1.75km from the River Neath, and the nearest water feature is the Crythan Brook, located approximately 240m to the southwest and there are no surface water abstractions within 250m of the site.
- The bedrock below the site is a Secondary A Aquifer and there are no groundwater abstractions of Source Protection Zones within 500m of the site.
- There is no significant contaminative history at the site, however there are levels of metals and polycyclic aromatic hydrocarbons, mainly in made ground but also in the topsoil. Although the levels are above a residential end use GAC, they are all generally below a commercial end use GAC, e.g. dibenzo(a,h)anthracene.
- The proposed development comprises a conventional residential estate which will include areas of car parking which are anticipated to be hard surfaced – surface drainage from these areas could contain leached oils and fuels from vehicle spills and leaks.
- Soakaways are being considered for the development.

Superseded

- Groundwater was not encountered in the investigation and is anticipated at a significant depth within the bedrock.
- Weathered bedrock is near the surface; it has a fine-grained fraction in its upper layers but it is not present across the whole of the site.
- Leachate testing has shown that the leachable levels of the metals and polyaromatic hydrocarbons are above EQS and other standard and present a possible risk to controlled waters.
- Further testing and assessment (detailed quantitative controlled waters risk assessment) would be needed to fully quantify the risks to controlled waters but given the generally marginal exceedances and distances to the nearest water courses and likely depth to the groundwater the risks may possibly be low; however, this would need determining/confirmation through further investigation, assessment and testing.
- The elevated levels are within the Made Ground and it may be prudent to simply remove the made ground from site, thus remove the source of the contamination.

The chosen method to assess, or lower the risks should be set out within a Remediation Strategy.

7.0 Recommendations

An updated list of recommendations from our previous site assessment is provided below. Some of the items are not discussed in this report but the full updated list is provided for clarity of works needed.

Required Further Actions:

- A phase of drilling and grouting has recently been completed and this will reduce the risk of subsidence from workings within the shallow coal seam. This work has not been discussed in this report and will be reported separately.
- The ground gas regime may have changed following the drilling and grouting remediation discussed above, further monitoring is necessary to confirm and this work is underway. The ground gas protection measures will need to be designed following this phase of work.
- Production of Remediation Strategy is in progress, this will discuss the removal of the rubble stockpile, surface burning materials, discuss options for Made Ground removal or further investigation and assessment (DQCWRA) and options for remediation and validation after these works.
- Slope Stability Assessment of soils on the southwestern boundary, notably near plots 8 to 11.
- Vegetation clearance of quarry face or drilling of boreholes and downhole discontinuity surveying on the southern boundary of the site and inspection to understand face stability and enable a judgement on safe standoff zones.
- Preparation of a Materials Management Plan (MMP) for re-use of soils on site and WM3 assessment of soils to be disposed of/re-used off-site, followed by WAC testing if disposal to landfill.
- Inclusion of this report within Health and Safety File for development.

Superseded

Recommended Further Actions:

- Measure CBR values at sub-grade prior to pavement construction.
- Verification testing of any soils imported to site.
- Measure CBR values at sub-grade prior to pavement construction.
- Verification testing of any soils imported to site.
- Careful watching brief during development for unrecorded mine entries across the site.
- Careful design of drainage to minimise excavation into very shallow bedrock.

We trust that the above and attached is clear and provides sufficient information for your present requirements. However, should you have any queries, or require further clarification, please do not hesitate to contact us.

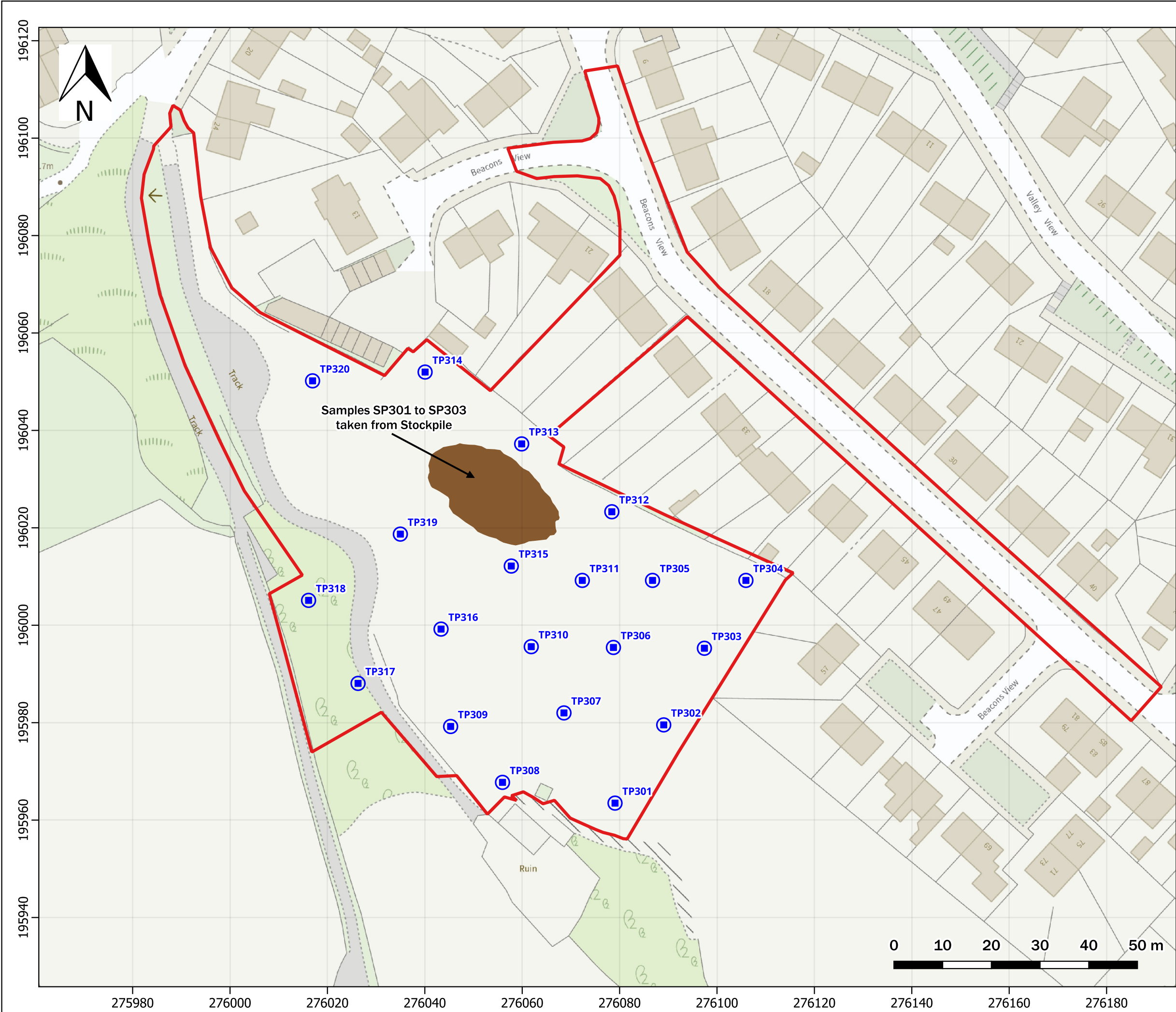
Yours sincerely,



Mat Elcock
Associate Director

Figure 1 - Investigation Point Plan

Enclosure A – Trial Pit Records
Enclosure B – Stockpile Trial Pit Records
Enclosure C – Geo-environmental Test Results – inc. BARGE Testing
Enclosure D – CLEA Site Specific Assessment for Tudor Inn – Arsenic



LEGEND:

Site Boundary

ESP Sampling Points

Topsoil Sampling Points

Turf and Topsoil Stockpile

NOTES:

1. Do not scale from drawing. This drawing should be read in conjunction with all other associated project information. Site features are approximate locations.

2. Contains OS data © Crown copyright and database right (2024). Data may be re-used under the terms of the Open Government Licence (OGL).

PROJECT NAME:	Tudor Inn, Supplementary Contamination Assessment
REPORT REF:	ESP.9254.02
CLIENT:	Rhyd Consult
FIGURE TITLE:	Investigation Point Plan
FIGURE NO: 01	REV.: 00
DATE: 05/12/2025	SCALE: 1: 750
DRAWN BY: NS	CHECKED BY: DT

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP301						
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: Face A Face B Face C			Backfill date: 02/10/2025		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Logged by: ESP-DT.											
Client: Rhyd Consult.														
Project No: 9254.02														
Survey details: Ground Level: 119.0 mOD Easting: 276078 mOD Northing: 195965 mOD Bearing:														
Depth		Sample		Test Details		Strata Details								
m		Type	Class	Type	Result	Description				Depth (thickness)	mOD	Legend		
0.10		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).				(0.15) 0.15	118.85			
						End of Trialpit at 0.150m								
										1.0				
										2.0				
										3.0				
Weather and environmental conditions: 1. Clear and dry.														
Other comments: 1. Grid reference and ground level approximate only, interpolated from available online information. 2. Trial pit constructed to obtain sample of Topsoil only. 3. Trial pit backfilled with arisings on completion.														

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP302	
Project Name: Supplementary Contamination Assessment.				Excavation date: 02/10/2025					
Site Location: Former Tudor Inn, Cimla.				Backfill date: 02/10/2025					
Client: Rhyd Consult.				Logged by: ESP-DT.					
Project No: 9254.02				Plan details: Face A Face B Face C		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Survey details: Ground Level: 118.0 mOD Easting: 276088 mOD Northing: 195984 mOD Bearing:									
Depth		Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend	
0.20	ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).	(0.30)			
					End of Trialpit at 0.300m	0.30	117.70		
						1.0			
						2.0			
						3.0			
Weather and environmental conditions:									
1. Clear and dry.									
Other comments:									
1. Grid reference and ground level approximate only, interpolated from available online information.									
2. Trial pit constructed to obtain sample of Topsoil only.									
3. Trial pit backfilled with arisings on completion.									

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Supplementary Contamination Assessment.

Former Tudor Inn,
Cimla.
Rhyd Consult.

9254.02

Excavation date:

Backfill date:

Logged by:

02/10/2025

02/10/2025

ESP-DT.

Plan details:

Face A

Face B

Face C

Excavation method/plant:

Shoring/support:

5T Tracked Excavator.

None.

TP303

Survey details:

Ground Level: 117.0 mOD

Easting: 276095 mOD

Northing: 195998 mOD

Bearing:

Face Stability:

Generally vertical and stable.

Groundwater observations:

No groundwater observed.

Depth		Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend	
0.15	ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).	(0.30)			
					End of Trialpit at 0.300m	0.30	116.70		
						1.0			
						2.0			
						3.0			

Weather and environmental conditions:

1. Clear and dry.

Other comments:

1. Grid reference and ground level approximate only, interpolated from available online information.

2. Trial pit constructed to obtain sample of Topsoil only.

3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP304				
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: ↔ Face B ↑ Face A ↓ Face C			Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Backfill date: 02/10/2025									
Client: Rhyd Consult.			Logged by: ESP-DT.									
Project No: 9254.02												
Survey details: Ground Level: 116.0 mOD Easting: 276103 mOD Northing: 196009 mOD Bearing:												
Depth m		Sample Type Class		Test Details Type Result		Strata Details Description Depth (thickness) mOD Legend						
0.20		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL). End of Trialpit at 0.300m (0.30) 0.30 115.70 1.0 2.0 3.0						
Weather and environmental conditions: 1. Clear and dry.												
Other comments: 1. Grid reference and ground level approximate only, interpolated from available online information. 2. Trial pit constructed to obtain sample of Topsoil only. 3. Trial pit backfilled with arisings on completion.												

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Excavation date:

Backfill date:

Logged by:

Plan details:

Face A

Face B

Face C

Survey details:

Ground Level:

Easting:

Northing:

Bearing:

Excavation method/plant:

Shoring/support:

TP305

Depth

m

Sample

Type

Class

Test Details

Type

Result

Strata Details

Description

Depth (thickness)

mOD

Legend

0.05

ES

Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).

(0.20)

116.80

End of Trialpit at 0.200m

Weather and environmental conditions:

Other comments:

1. Clear and dry.

1. Grid reference and ground level approximate only, interpolated from available online information.

2. Trial pit constructed to obtain sample of Topsoil only.

3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Survey details:

Excavation date:

Backfill date:

Logged by:

Plan details:

Excavation method/plant:

Shoring/support:

Face Stability:

TP306

Groundwater observations:

Supplementary Contamination Assessment.

Former Tudor Inn, Cimla.

Rhyd Consult.

9254.02

Ground Level: 118.0 mOD

Easting: 276081 mOD

Northing: 196001 mOD

Bearing:

02/10/2025

02/10/2025

ESP-DT.

Face A

Face B

Face C

5T Tracked Excavator.

None.

Generally vertical and stable.

No groundwater observed.

Depth		Sample		Test Details		Strata Details			
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend	
0.10	ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).	(0.20)	117.80		
					End of Trialpit at 0.200m	0.20			
						1.0			
						2.0			
						3.0			

Weather and environmental conditions:

1. Clear and dry.

Other comments:

1. Grid reference and ground level approximate only, interpolated from available online information.

2. Trial pit constructed to obtain sample of Topsoil only.

3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Excavation date:

Backfill date:

Logged by:

Plan details:

Face A

Face B

Face C

Survey details:

Ground Level:

Easting:

Northing:

Bearing:

Excavation method/plant:

Shoring/support:

TP307

Depth

m

Sample

Type

Class

Test Details

Type

Result

Strata Details

Description

Depth (thickness)

mOD

Legend

0.05

ES

Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).

(0.10)
0.10

117.90

End of Trialpit at 0.100m

1.0

2.0

3.0

Weather and environmental conditions:

1. Clear and dry.

Other comments:

1. Grid reference and ground level approximate only, interpolated from available online information.
2. Trial pit constructed to obtain sample of Topsoil only.
3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Excavation date:

Backfill date:

Logged by:

Plan details:

Face A

Face B

Face C

Survey details:

Ground Level:

Easting:

Northing:

Bearing:

Excavation method/plant:

Shoring/support:

TP308

Depth

m

Sample

Type

Class

Test Details

Type

Result

Strata Details

Description

Depth (thickness)

mOD

Legend

0.10

ES

Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).

(0.20)

117.80

End of Trialpit at 0.200m

Weather and environmental conditions:

Other comments:

1. Clear and dry.

1. Grid reference and ground level approximate only, interpolated from available online information.

2. Trial pit constructed to obtain sample of Topsoil only.

3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP309				
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: ↔ Face B ↑ Face A ↓ Face C			Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Backfill date: 02/10/2025									
Client: Rhyd Consult.			Logged by: ESP-DT.									
Project No: 9254.02												
Survey details: Ground Level: 118.0 mOD Easting: 276045 mOD Northing: 195987 mOD Bearing:												
Depth m		Sample Type Class		Test Details Type Result		Strata Details Description Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL). End of Trialpit at 0.100m Depth (thickness) (0.10) 0.10 1.0 2.0 3.0 mOD 117.90 Legend						
Weather and environmental conditions: 1. Clear and dry.												
Other comments: 1. Grid reference and ground level approximate only, interpolated from available online information. 2. Trial pit constructed to obtain sample of Topsoil only. 3. Trial pit backfilled with arisings on completion.												

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: 5T Tracked Excavator.		Shoring/support: None.		TP310									
Project Name: Supplementary Contamination Assessment.				Excavation date: 02/10/2025		Plan details: Face A Face B Face C				Face Stability: Generally vertical and stable.				Groundwater observations: No groundwater observed.			
Site Location: Former Tudor Inn, Cimla.				Backfill date: 02/10/2025													
Client: Rhyd Consult.				Logged by: ESP-DT.													
Project No: 9254.02																	
Survey details:																	
Ground Level: 117.0 mOD																	
Easting: 276062 mOD																	
Northing: 196008 mOD																	
Bearing:																	
Depth		Sample		Test Details		Strata Details											
m		Type	Class	Type	Result	Description						Depth (thickness)	mOD	Legend			
0.05		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).						(0.10) 0.10	116.90				
						End of Trialpit at 0.100m											

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Excavation date:

Backfill date:

Logged by:

Plan details:

Face A

Face B

Face C

Survey details:

Ground Level:

Easting:

Northing:

Bearing:

Excavation method/plant:

Shoring/support:

TP311

Depth

m

Sample

Type

Class

Test Details

Type

Result

Strata Details

Description

Depth (thickness)

mOD

Legend

0.05

ES

Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).

(0.10)
0.10

116.90

1.0

2.0

3.0

End of Trialpit at 0.100m

Weather and environmental conditions:

Other comments:

1. Clear and dry.

1. Grid reference and ground level approximate only, interpolated from available online information.

2. Trial pit constructed to obtain sample of Topsoil only.

3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP312						
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: Face A Face B Face C			Backfill date: 02/10/2025		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Logged by: ESP-DT.											
Client: Rhyd Consult.														
Project No: 9254.02														
Survey details: Ground Level: 117.0 mOD Easting: 276069 mOD Northing: 196033 mOD Bearing:														
Depth		Sample		Test Details		Strata Details								
m	Type	Class	Type	Result	Description			Depth (thickness)	mOD	Legend				
0.20	ES				Soft dark grey and black sandy gravelly CLAY with a low angular to subangular cobble content. Frequent anthropogenic materials noted, including plastic and probable tile fragments. (MADE GROUND).			(0.25)	116.75					
					Light brown sandy clayey GRAVEL. (Probable weathered SWANSEA MEMBER).			(0.40)						
					End of Trialpit at 0.650m			0.65	116.35					
								1.0						
								2.0						
								3.0						
Weather and environmental conditions: 1. Clear and dry.														
Other comments: 1. Grid reference and ground level approximate only, interpolated from available online information. 2. Trial pit constructed to obtain sample of Made Ground only. 3. Trial pit backfilled with arisings on completion.														

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP313									
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: ↔ Face B ↑ Face A ↓ Face C			Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.						
Site Location: Former Tudor Inn, Cimla.			Backfill date: 02/10/2025														
Client: Rhyd Consult.			Logged by: ESP-DT.														
Project No: 9254.02			Survey details: Ground Level: 116.0 mOD Easting: 276054 mOD Northing: 196045 mOD Bearing:														
Depth m		Sample Type Class				Test Details Type Result		Strata Details Description Depth (thickness) mOD Legend									
0.30		ES				Soft dark brown sandy gravelly CLAY with low to medium angular cobble content. Frequent anthropogenic materials noted, including brick, concrete, metal and glass. (MADE GROUND). End of Trialpit at 0.200m					(0.20) 0.20		115.80				
											1.0						
											2.0						
											3.0						
Weather and environmental conditions:																	
1. Clear and dry.																	
Other comments:																	
1. Grid reference and ground level approximate only, interpolated from available online information.																	
2. Trial pit constructed to obtain sample of Made Ground only.																	
3. Trial pit backfilled with arisings on completion.																	

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP314					
Project Name: Supplementary Contamination Assessment.				Excavation date: 02/10/2025		Plan details: Face B Face A Face C		Backfill date: 02/10/2025		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.				Logged by: ESP-DT.									
Client: Rhyd Consult.													
Project No: 9254.02													
Survey details: Ground Level: 117.0 mOD Easting: 276040 mOD Northing: 196055 mOD Bearing:													
Depth		Sample		Test Details		Strata Details							
m		Type	Class	Type	Result	Description					Depth (thickness)	mOD	Legend
0.10		ES				Loose dark grey and reddish brown/grey, occasionally dark blackish grey clayey very sandy fine to coarse angular GRAVEL with a low angular cobble content. Frequent anthropogenic materials noted, including brick, concrete, and tile. Probable weathered Swansea Member bedrock at base. (MADE GROUND).					(0.25)	116.75	
						End of Trialpit at 0.250m					0.25		
											1.0		
											2.0		
											3.0		
Weather and environmental conditions:													
1. Clear and dry.													
Other comments:													
1. Grid reference and ground level approximate only, interpolated from available online information.													
2. Trial pit constructed to obtain sample of Made Ground only.													
3. Trial pit backfilled with arisings on completion.													

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP315						
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: Face A Face B Face C			Backfill date: 02/10/2025		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Logged by: ESP-DT.											
Client: Rhyd Consult.														
Project No: 9254.02														
Survey details: Ground Level: 117.0 mOD Easting: 276047 mOD Northing: 196019 mOD Bearing:														
Depth		Sample		Test Details		Strata Details								
m		Type	Class	Type	Result	Description				Depth (thickness)	mOD	Legend		
0.20		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL). End of Trialpit at 0.150m				(0.15) 0.15	116.85			
										1.0				
										2.0				
										3.0				
Weather and environmental conditions: 1. Clear and dry.														
Other comments: 1. Grid reference and ground level approximate only, interpolated from available online information. 2. Trial pit constructed to obtain sample of Topsoil only. 3. Trial pit backfilled with arisings on completion.														

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP316						
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: Face A Face B Face C			Backfill date: 02/10/2025		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Logged by: ESP-DT.											
Client: Rhyd Consult.														
Project No: 9254.02														
Survey details: Ground Level: 117.0 mOD Easting: 276038 mOD Northing: 196013 mOD Bearing:														
Depth		Sample		Test Details		Strata Details								
m		Type	Class	Type	Result	Description				Depth (thickness)	mOD	Legend		
0.10		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).				(0.15) 0.15	116.85			
						End of Trialpit at 0.150m								
										1.0				
										2.0				
										3.0				
Weather and environmental conditions: 1. Clear and dry.														
Other comments: 1. Grid reference and ground level approximate only, interpolated from available online information. 2. Trial pit constructed to obtain sample of Topsoil only. 3. Trial pit backfilled with arisings on completion.														

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: ST Tracked Excavator.		Shoring/support: None.		TP317		
Project Name: Supplementary Contamination Assessment. Site Location: Former Tudor Inn, Cimla. Client: Rhyd Consult. Project No: 9254.02			Excavation date: 02/10/2025 Backfill date: 02/10/2025 Logged by: ESP-DT.		Plan details: 		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Survey details: Ground Level: 116.0 mOD Easting: 276023 mOD Northing: 196000 mOD Bearing:										
Depth		Sample		Test Details		Strata Details				
m		Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend	
0.05		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).	(0.15) 0.15	115.85		
						End of Trialpit at 0.150m				
							1.0			
							2.0			
							3.0			
Weather and environmental conditions:										
1. Clear and dry.										
Other comments:										
1. Grid reference and ground level approximate only, interpolated from available online information.										
2. Trial pit constructed to obtain sample of Topsoil only.										
3. Trial pit backfilled with arisings on completion.										

Superseded

[illegible]

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Survey details:

Supplementary Contamination Assessment.

Former Tudor Inn,
Cimla.
Rhyd Consult.

Rhyd Consult.

9254.02

Ground Level:
Easting:
Northing:
Bearing:

Excavation date:

Backfill date:

Logged by:

02/10/2025

02/10/2025

ESP-DT.

Plan details:

Face A


Excavation method/plant:

Shoring/support:

ST Tracked Excavator.

None.

TP319

Groundwater observations:

No groundwater observed.

Face Stability:

Generally vertical and stable.

Depth		Sample		Test Details		Strata Details		
m	Type	Class	Type	Result	Description	Depth (thickness)	mOD	Legend
0.05	ES				Soft dark brown slightly sandy slightly gravelly CLAY. Frequent rootlets. Probable weathered Swansea Member bedrock at base. (TOPSOIL).	(0.15) 0.15	116.85	
					End of Trialpit at 0.150m			
						1.0		
						2.0		
						3.0		

Weather and environmental conditions:

Other comments:

1. Clear and dry.

1. Grid reference and ground level approximate only, interpolated from available online information.

2. Trial pit constructed to obtain sample of Topsoil only.

3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

Project Name:

Site Location:

Client:

Project No:

Excavation date:

Backfill date:

Logged by:

Plan details:

Face A

Face B

Face C

Survey details:

Ground Level:

Easting:

Northing:

Bearing:

Excavation method/plant:

Shoring/support:

TP320

Depth

m

Sample

Type

Class

Test Details

Type

Result

Strata Details

Description

Depth (thickness)

mOD

Legend

0.10

ES

TARMACADAM. (MADE GROUND).

Loose reddish grey and black sandy GRAVEL with frequent ash. (MADE GROUND).

End of Trialpit at 0.400m

(0.05)

0.05

(0.35)

0.40

1.0

2.0

3.0

115.95

115.60

Weather and environmental conditions:

Other comments:

1. Clear and dry.

1. Grid reference and ground level approximate only, interpolated from available online information.

2. Trial pit constructed to obtain sample of Made Ground only.

3. Trial pit backfilled with arisings on completion.

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: 5T Tracked Excavator.		Shoring/support: None.		SP301						
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: ↔ Face B ↑ Face A ↓ Face C			Backfill date: 02/10/2025		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Logged by: ESP-DT.											
Client: Rhyd Consult.														
Project No: 9254.02														
Survey details: Ground Level:														
Easting: 276055 mOD														
Northing: 196030 mOD														
Bearing:														
Depth		Sample		Test Details		Strata Details								
m		Type	Class	Type	Result	Description				Depth (thickness)	mOD	Legend		
0.20		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Stockpiled Topsoil. (MADE GROUND).				(0.30)				
						End of Trialpit at 0.300m				0.30				
										1.0				
										2.0				
										3.0				
Weather and environmental conditions:														
1. Clear and dry.														
Other comments:														
1. Grid reference and ground level approximate only, interpolated from available online information.														
2. Trial pit constructed to obtain sample of stockpiled Topsoil only.														
3. Trial pit backfilled with arisings on completion.														

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: 5T Tracked Excavator.		Shoring/support: None.		SP302						
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: ↔ Face B ↑ Face A ↓ Face C			Backfill date: 02/10/2025		Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Logged by: ESP-DT.											
Client: Rhyd Consult.														
Project No: 9254.02														
Survey details: Ground Level:														
Easting: 276050 mOD														
Northing: 196035 mOD														
Bearing:														
Depth		Sample		Test Details		Strata Details								
m		Type	Class	Type	Result	Description					Depth (thickness)	mOD	Legend	
0.20		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Stockpiled Topsoil. (MADE GROUND).					(0.30)			
						End of Trialpit at 0.300m					0.30			
											1.0			
											2.0			
											3.0			
Weather and environmental conditions:														
1. Clear and dry.														
Other comments:														
1. Grid reference and ground level approximate only, interpolated from available online information.														
2. Trial pit constructed to obtain sample of stockpiled Topsoil only.														
3. Trial pit backfilled with arisings on completion.														

Superseded

Earth Science Partnership Consulting Engineers Geologists Environmental Scientists				Excavation method/plant: 5T Tracked Excavator.		Shoring/support: None.		SP303				
Project Name: Supplementary Contamination Assessment.			Excavation date: 02/10/2025			Plan details: ↔ Face B ↑ Face A ↓ Face C			Face Stability: Generally vertical and stable.		Groundwater observations: No groundwater observed.	
Site Location: Former Tudor Inn, Cimla.			Backfill date: 02/10/2025									
Client: Rhyd Consult.			Logged by: ESP-DT.									
Project No: 9254.02												
Survey details: Ground Level: Easting: 276043 mOD Northing: 196038 mOD Bearing:												
Depth		Sample		Test Details		Strata Details						
m		Type	Class	Type	Result	Description			Depth (thickness)	mOD	Legend	
0.20		ES				Soft dark brown slightly sandy slightly gravelly CLAY. Stockpiled Topsoil. (MADE GROUND).			(0.30)			
						End of Trialpit at 0.300m			0.30			
									1.0			
									2.0			
									3.0			
Weather and environmental conditions:												
1. Clear and dry.												
Other comments:												
1. Grid reference and ground level approximate only, interpolated from available online information.												
2. Trial pit constructed to obtain sample of stockpiled Topsoil only.												
3. Trial pit backfilled with arisings on completion.												

Superseded



Certificate of Analysis

Certificate Number

25-22905-1

Issued:

15-Dec-25

Client

Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference

25-22905-1

Client Reference ~

9254.02

Order No ~

13807

Contract Title ~

Tudor Inn, Cimla

Description

23 Soil samples, 5 Leachate prepared by DETS samples.

Date Received

03-Oct-25

Date Started

03-Oct-25

Date Completed

15-Dec-25

Test Procedures

Identified by prefix DETSn (details on request).

Notes

This report supersedes 25-22905; Sample info updated at client request

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By


Louise Cook
Contracts Manager



Sample Deviations present. See Deviation Table Section for details.

Superseded



Summary of Chemical Analysis Soil Samples

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2577763	2577764	2577765	2577766	2577767	2577768
Sample ID ~	TP301	TP302	TP303	TP304	TP305	TP306
Depth ~	0.10	0.20	0.15	0.20	0.05	0.10
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	47	33	48	58	38	21
Beryllium	DETSC 2301#	0.2	mg/kg						
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg						
Cadmium	DETSC 2301#	0.1	mg/kg						
Chromium	DETSC 2301#	0.15	mg/kg						
Chromium, Hexavalent	DETSC 2204*	1	mg/kg						
Copper	DETSC 2301#	0.2	mg/kg						
Lead	DETSC 2301#	0.3	mg/kg						
Mercury	DETSC 2325#	0.05	mg/kg						
Nickel	DETSC 2301#	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg						
Vanadium	DETSC 2301#	0.8	mg/kg						
Zinc	DETSC 2301#	1	mg/kg						
Inorganics									
pH	DETSC 2008#		pH						
Cyanide, Total	DETSC 2130#	0.1	mg/kg						
Organic matter	DETSC 2002#	0.1	%						
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg						
Acenaphthylene	DETSC 3303#	0.03	mg/kg						
Anthracene	DETSC 3303	0.03	mg/kg						
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg						
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg						
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg						
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg						
Chrysene	DETSC 3303	0.03	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg						
Fluoranthene	DETSC 3303#	0.03	mg/kg						
Fluorene	DETSC 3303	0.03	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg						
Naphthalene	DETSC 3303#	0.03	mg/kg						
Phenanthrene	DETSC 3303#	0.03	mg/kg						
Pyrene	DETSC 3303#	0.03	mg/kg						
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						

Superseded



Summary of Chemical Analysis Soil Samples

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2577769	2577770	2577771	2577772	2577773	2577774
Sample ID ~	TP307	TP308	TP309	TP310	TP311	TP312
Depth ~	0.05	0.10	0.05	0.05	0.05	0.20
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	50	60	34	58	59	42
Beryllium	DETSC 2301#	0.2	mg/kg						0.8
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg						0.5
Cadmium	DETSC 2301#	0.1	mg/kg						1.2
Chromium	DETSC 2301#	0.15	mg/kg						15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg						< 1.0
Copper	DETSC 2301#	0.2	mg/kg						140
Lead	DETSC 2301#	0.3	mg/kg						150
Mercury	DETSC 2325#	0.05	mg/kg						0.22
Nickel	DETSC 2301#	1	mg/kg						26
Selenium	DETSC 2301#	0.5	mg/kg						< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg						23
Zinc	DETSC 2301#	1	mg/kg						280
Inorganics									
pH	DETSC 2008#		pH						7.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg						0.3
Organic matter	DETSC 2002#	0.1	%						16
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg						< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg						0.03
Anthracene	DETSC 3303	0.03	mg/kg						0.08
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg						0.43
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg						0.34
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg						0.68
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg						0.22
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg						0.23
Chrysene	DETSC 3303	0.03	mg/kg						0.46
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg						0.06
Fluoranthene	DETSC 3303#	0.03	mg/kg						0.93
Fluorene	DETSC 3303	0.03	mg/kg						< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg						0.22
Naphthalene	DETSC 3303#	0.03	mg/kg						0.07
Phenanthrene	DETSC 3303#	0.03	mg/kg						0.46
Pyrene	DETSC 3303#	0.03	mg/kg						0.77
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg						4.9
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						0.5

Superseded



Summary of Chemical Analysis Soil Samples

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2577775	2577776	2577777	2577778	2577779	2577780
Sample ID ~	TP313	TP314	TP315	TP316	TP317	TP318
Depth ~	0.10	0.20	0.10	0.05	0.05	0.05
Other ID ~						
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	26	25	43	31	33	35
Beryllium	DETSC 2301#	0.2	mg/kg	0.5	1.0				0.5
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.6	0.3				0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.9	0.6				0.4
Chromium	DETSC 2301#	0.15	mg/kg	92	18				12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0				< 1.0
Copper	DETSC 2301#	0.2	mg/kg	100	54				93
Lead	DETSC 2301#	0.3	mg/kg	200	180				54
Mercury	DETSC 2325#	0.05	mg/kg	0.15	0.05				< 0.05
Nickel	DETSC 2301#	1	mg/kg	21	26				20
Selenium	DETSC 2301#	0.5	mg/kg	0.6	< 0.5				< 0.5
Vanadium	DETSC 2301#	0.8	mg/kg	38	34				20
Zinc	DETSC 2301#	1	mg/kg	430	240				200
Inorganics									
pH	DETSC 2008#		pH	8.8	8.3				8.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.4	0.3				< 0.1
Organic matter	DETSC 2002#	0.1	%	8.3	4.6				2.1
PAHs									
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.06	0.10				< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.11				0.07
Anthracene	DETSC 3303	0.03	mg/kg	0.08	0.22				0.11
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.66	1.6				0.71
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.66	2.1				0.76
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	1.1	2.9				1.2
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.54	2.0				0.55
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.40	1.0				0.39
Chrysene	DETSC 3303	0.03	mg/kg	0.61	1.3				0.59
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.15	0.49				0.14
Fluoranthene	DETSC 3303#	0.03	mg/kg	1.1	2.1				1.1
Fluorene	DETSC 3303	0.03	mg/kg	0.04	0.08				< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.46	1.6				0.48
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04				< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.38	0.64				0.33
Pyrene	DETSC 3303#	0.03	mg/kg	0.83	1.7				0.89
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	7.1	18				7.3
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.4	0.3				< 0.3

Superseded



Summary of Chemical Analysis Soil Samples

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2577781	2577782	2577783	2577784	2577785
Sample ID ~	TP319	TP320	SP301	SP302	SP303
Depth ~	0.10	0.30			
Other ID ~					
Sample Type ~	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date ~	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	40	31	42	48	57
Beryllium	DETSC 2301#	0.2	mg/kg		1.3			
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg		0.4			
Cadmium	DETSC 2301#	0.1	mg/kg		1.0			
Chromium	DETSC 2301#	0.15	mg/kg		27			
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		< 1.0			
Copper	DETSC 2301#	0.2	mg/kg		130			
Lead	DETSC 2301#	0.3	mg/kg		120			
Mercury	DETSC 2325#	0.05	mg/kg		0.10			
Nickel	DETSC 2301#	1	mg/kg		42			
Selenium	DETSC 2301#	0.5	mg/kg		< 0.5			
Vanadium	DETSC 2301#	0.8	mg/kg		63			
Zinc	DETSC 2301#	1	mg/kg		260			
Inorganics								
pH	DETSC 2008#		pH		7.7			
Cyanide, Total	DETSC 2130#	0.1	mg/kg		0.3			
Organic matter	DETSC 2002#	0.1	%		8.6			
PAHs								
Acenaphthene	DETSC 3303#	0.03	mg/kg		0.04			
Acenaphthylene	DETSC 3303#	0.03	mg/kg		0.08			
Anthracene	DETSC 3303	0.03	mg/kg		0.12			
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.89			
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		1.5			
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		2.0			
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		1.2			
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		0.65			
Chrysene	DETSC 3303	0.03	mg/kg		0.77			
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		0.33			
Fluoranthene	DETSC 3303#	0.03	mg/kg		1.3			
Fluorene	DETSC 3303	0.03	mg/kg		0.03			
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		1.1			
Naphthalene	DETSC 3303#	0.03	mg/kg		0.04			
Phenanthrene	DETSC 3303#	0.03	mg/kg		0.35			
Pyrene	DETSC 3303#	0.03	mg/kg		1.2			
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		11			
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		< 0.3			

Superseded



Summary of Chemical Analysis Leachate Samples

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2577786	2577787	2577788	2577789	2577790
Sample ID ~	TP312	TP313	TP314	TP318	TP320
Depth ~	0.20	0.10	0.20	0.05	0.30
Other ID ~					
Sample Type ~	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date ~	02/10/2025	02/10/2025	02/10/2025	02/10/2025	02/10/2025
Sampling Time ~	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Preparation								
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y	Y	Y
Metals								
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	8.2	6.3	6.0	9.1	3.8
Barium, Dissolved	DETSC 2306	0.26	ug/l	31	28	42	41	28
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	< 12.0	< 12.0	< 12.0	< 12.0	17.7
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.04	0.04	0.05	0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.85	2.0	1.4	1.6	2.2
Copper, Dissolved	DETSC 2306	0.4	ug/l	6.3	5.5	5.0	8.2	4.7
Iron, Dissolved	DETSC 2306	5.5	ug/l	340	670	580	660	190
Lead, Dissolved	DETSC 2306	0.09	ug/l	9.6	12	22	7.8	3.5
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.01	0.01	0.01	0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	0.9	1.2	1.4	1.2	0.8
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.82	0.84	0.83	0.83	0.85
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	2.2	6.7	7.4	5.6	1.4
Zinc, Dissolved	DETSC 2306	1.3	ug/l	19	21	18	15	14
Inorganics								
pH	DETSC 2008		pH	7.0	7.0	7.4	7.2	7.0
Cyanide, Total Low Level	DETSC 2131	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Phenol - Monohydric Low Level	DETSC 2131	1.5	ug/l	< 1.5	< 1.5	2.1	< 1.5	< 1.5
PAHs								
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.02	0.02	0.02
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.02	0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	0.01	0.01	0.02	0.02	0.02
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.01	0.02	0.03	0.03	0.03
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.03	0.04	0.06	0.07	0.07
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.02	0.03	0.05	0.06	0.06
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.04	0.01	0.02	0.02	0.02
Chrysene	DETSC 3304	0.01	ug/l	0.02	0.01	0.03	0.02	0.02
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.02	0.02	0.03	0.03	0.03
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.02	0.03	0.05	0.07	0.07
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	DETSC 3304	0.01	ug/l	0.03	0.01	0.02	0.02	0.02
Pyrene	DETSC 3304	0.01	ug/l	0.02	0.02	0.03	0.03	0.03
PAH Total	DETSC 3304	0.2	ug/l	0.23	< 0.20	0.38	0.41	0.40

Superseded



Summary of Asbestos Analysis Soil Samples

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2577774	TP312 0.20	SOIL	NAD	none	Josh Best
2577775	TP313 0.10	SOIL	NAD	none	Josh Best
2577776	TP314 0.20	SOIL	NAD	none	Josh Best
2577780	TP318 0.05	SOIL	NAD	none	Josh Best
2577782	TP320 0.30	SOIL	Chrysotile	Chrysotile present as fibre bundles	Josh Best

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Superseded



Information in Support of the Analytical Results

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract ~ Tudor Inn, Cimla

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date	Containers Received	Holding time	Incorrect container for tests
		Sampled ~		exceeded for tests	
2577763	TP301 0.10 SOIL	02/10/25	PT 1L		
2577764	TP302 0.20 SOIL	02/10/25	PT 1L		
2577765	TP303 0.15 SOIL	02/10/25	PT 1L		
2577766	TP304 0.20 SOIL	02/10/25	PT 1L		
2577767	TP305 0.05 SOIL	02/10/25	PT 1L		
2577768	TP306 0.10 SOIL	02/10/25	PT 1L		
2577769	TP307 0.05 SOIL	02/10/25	PT 1L		
2577770	TP308 0.10 SOIL	02/10/25	PT 1L		
2577771	TP309 0.05 SOIL	02/10/25	PT 1L		
2577772	TP310 0.05 SOIL	02/10/25	PT 1L		
2577773	TP311 0.05 SOIL	02/10/25	PT 1L		
2577774	TP312 0.20 SOIL	02/10/25	PT 1L		Naphthalene, PAH MS
2577775	TP313 0.10 SOIL	02/10/25	GJ 250ml, PT 1L		
2577776	TP314 0.20 SOIL	02/10/25	GJ 250ml, PT 1L		
2577777	TP315 0.10 SOIL	02/10/25	PT 1L		
2577778	TP316 0.05 SOIL	02/10/25	PT 1L		
2577779	TP317 0.05 SOIL	02/10/25	PT 1L		
2577780	TP318 0.05 SOIL	02/10/25	GJ 250ml, PT 1L		
2577781	TP319 0.10 SOIL	02/10/25	PT 1L		
2577782	TP320 0.30 SOIL	02/10/25	GJ 250ml, PT 1L		
2577783	SP301 SOIL	02/10/25	GJ 250ml, PT 1L		
2577784	SP302 SOIL	02/10/25	GJ 250ml, PT 1L		
2577785	SP303 SOIL	02/10/25	GJ 250ml, PT 1L		
2577786	TP312 0.20 LEACHATE	02/10/25	PT 1L		
2577787	TP313 0.10 LEACHATE	02/10/25	GJ 250ml, PT 1L		
2577788	TP314 0.20 LEACHATE	02/10/25	GJ 250ml, PT 1L		
2577789	TP318 0.05 LEACHATE	02/10/25	GJ 250ml, PT 1L		
2577790	TP320 0.30 LEACHATE	02/10/25	GJ 250ml, PT 1L		

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Information in Support of the Analytical Results

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract ~ Tudor Inn, Cimla

Key: P-Plastic T-Tub G-Glass J-Jar
Normec DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 250µm sieve
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Superseded



Information in Support of the Analytical Results

Our Ref 25-22905-1
Client Ref ~ 9254.02
Contract ~ Tudor Inn, Cimla

- Key:**
- ~ Sample details are provided by the client and can affect the validity of the results
 - * -not accredited.
 - # -MCERTS (accreditation only applies if report carries the MCERTS logo).
 - \$ -subcontracted.
 - n/s -not supplied.
 - I/S -insufficient sample.
 - U/S -unsuitable sample.
 - t/f -to follow.
 - nd -not detected.

End of Report Ver 25.10.03

Superseded



Certificate of Analysis

Certificate Number 25-23713-2 *Issued:* 15-Dec-25

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 25-23713-2

Client Reference ~ 9254.02

Order No ~ 13807

Contract Title ~ Tudor Inn, Cimla

Description 3 Soil samples.

Date Received 03-Oct-25

Date Started 14-Oct-25

Date Completed 15-Dec-25

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 25-23713-1; Sample info updated at client request**
Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By 
Louise Cook
Contracts Manager



Superseded



Summary of Chemical Analysis Soil Samples

Our Ref 25-23713-2
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2582848	2582849	2582850
Sample ID ~	TP301	TP305	TP320
Depth ~	0.10	0.05	0.30
Other ID ~			
Sample Type ~	SOIL	SOIL	SOIL
Sampling Date ~	02/10/2025	02/10/2025	02/10/2025
Sampling Time ~	n/s	n/s	n/s

Test	Method	LOD	Units			
Asbestos Quantification (Gravimetric)	DETSC 1102	0.001	%			0.007
Metals						
Arsenic Gastric % Bioaccessible (% of Total As)	DETSC 2400*	0	%	2.0	2.6	
Arsenic Gastric mg/kg Bioaccessible	DETSC 2400*	0.5	mg/kg	0.9	1.0	
Arsenic Gastro Intestinal % Bioaccessible (% of Total As)	DETSC 2400*	0	%	1.1	0.9	
Arsenic Gastro Intestinal mg/kg Bioaccessible	DETSC 2400*	0.5	mg/kg	0.5	< 0.5	
Arsenic	DETSC 2301#	0.2	mg/kg	47	38	

Superseded



Summary of Asbestos Analysis Samples

Our Ref 25-23713-2
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	Sample ID	Sample Location	Material Type	Result	Comment*	Analyst
Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.						

Summary of Asbestos Quantification Analysis Soil Samples

Our Ref 25-23713-2
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2582580
Sample ID ~	TP320
Depth ~	0.3
Other ID ~	
Sample Type ~	
Sampling Date ~	02/10/2025
Sampling Time ~	n/s

Test	Method	LOQ	Units	
Total Mass% Asbestos (a+b+c)	DETSC 1102	< 0.001	Mass %	0.007
Gravimetric Quantification (a)	DETSC 1102	< 0.001	Mass %	na
Detailed Gravimetric Quantification (b)	DETSC 1102	< 0.001	Mass %	0.007
Quantification by PCOM (c)	DETSC 1102	< 0.001	Mass %	na
Potentially Respirable Fibres (d)	DETSC 1102	< 0.001	Fibres/g	na
Breakdown of Gravimetric Analysis (a)				
Mass of Sample			g	401.79
ACMs present*			type	
Mass of ACM in sample			g	
% ACM by mass			%	
% asbestos in ACM			%	
% asbestos in sample			%	
Breakdown of Detailed Gravimetric Analysis (b)				
% Amphibole bundles in sample			Mass %	na
% Chrysotile bundles in sample			Mass %	0.007
Breakdown of PCOM Analysis (c)				
% Amphibole fibres in sample			Mass %	na
% Chrysotile fibres in sample			Mass %	na
Breakdown of Potentially Respirable Fibre Analysis (d)				
Amphibole fibres			Fibres/g	na
Chrysotile fibres			Fibres/g	na

* Denotes test or material description outside of UKAS accreditation.

% asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264.

Recommended sample size for quantification is approximately 1kg

denotes deviating sample

The results are based on dry weight.

Superseded



Information in Support of the Analytical Results

Our Ref 25-23713-2
Client Ref ~ 9254.02
Contract ~ Tudor Inn, Cimla

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date	Containers Received	Holding time exceeded for tests	Incorrect container for tests
		Sampled ~			
2582848	TP301 0.10 SOIL	02/10/25	PT 1L		
2582849	TP305 0.05 SOIL	02/10/25	PT 1L		
2582850	TP320 0.30 SOIL	02/10/25	GJ 250ml, PT 1L		

Key: P-Plastic T-Tub G-Glass J-Jar
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Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

- Key:**
~ Sample details are provided by the client and can affect the validity of the results
* -not accredited.
-MCERTS (accreditation only applies if report carries the MCERTS logo).
\$ -subcontracted.
n/s -not supplied.
I/S -insufficient sample.
U/S -unsuitable sample.
t/f -to follow.
nd -not detected.

End of Report Ver 25.10.03

Superseded



Certificate of Analysis

Certificate Number 25-26655-1 *Issued:* 15-Dec-25

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 25-26655-1

Client Reference ~ 9254.02

Order No ~ 13807

Contract Title ~ Tudor Inn, Cimla

Description 1 Soil sample.

Date Received 03-Oct-25

Date Started 19-Nov-25

Date Completed 15-Dec-25

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 25-26655; Sample info updated at client request**
Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By 
Louise Cook
Contracts Manager



Superseded



Summary of Chemical Analysis Soil Samples

Our Ref 25-26655-1
Client Ref ~ 9254.02
Contract Title ~ Tudor Inn, Cimla

Lab No	2600768
Sample ID ~	TP305
Depth ~	0.05
Other ID ~	
Sample Type ~	SOIL
Sampling Date ~	02/10/2025
Sampling Time ~	n/s

Test	Method	LOD	Units	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	41

Superseded



Information in Support of the Analytical Results

Our Ref 25-26655-1
Client Ref ~ 9254.02
Contract ~ Tudor Inn, Cimla

Containers Received & Deviating Samples

Lab No	Sample ID ~	Date	Containers Received	Holding time exceeded for tests	Incorrect container for tests
		Sampled ~			
2600768	TP305 0.05 SOIL	02/10/25	PT 1L		

Key: P-Plastic T-Tub

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Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 250µm sieve
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

- Key:**
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 - t/f -to follow.
 - nd -not detected.

End of Report Ver 25.10.03

Superseded

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Report title	Additional Geo-environmental Assessment, Tudor Inn, Cimla	 Environment Agency
Created by	MTE at Earth Science Partnership	
RESULTS		

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