

**STAGE 2 CONTAMINATION
ASSESSMENT**

**LAND SOUTH OF NANT COTTAGE, LOWER
ROAD, COEDPOETH, WREXHAM**

For: Mr John Williams

June 2023

R3213-R02-v1

DOCUMENT CONTROL SHEET

Report Title: Nant Cottage, Lower Road, Coedpoeth, Wrexham
Stage 2 – Contamination Assessment
Mr John Williams

Client:

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LAND SOUTH OF NANT COTTAGE, LOWER ROAD, COEDPOETH, WREXHAM

STAGE 2 CONTAMINATION ASSESSMENT

For John Williams

June 2023

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1. Introduction

- 1.1. Outline planning permission (ref: P/2021/0519) has previously been granted by Wrexham County Borough Council (WCBC) permitting the construction of a single detached dwelling with associated access and paddock. A contaminated land condition (Condition 4) was placed requiring a phased contamination assessment. The client has subsequently submitted a retrospective planning application (ref. P/2023/0138) to that previously approved under application P/2021/0519).
- 1.2. Smith Grant LLP (SGP) had previously been instructed by the client to undertake a Phase 1 Contamination Assessment Desk Study (ref. R2259-R01-v1) for a neighbouring site under planning ref P/2014/0331. A copy of this report was also submitted under application P/2021/0519) relating to the Site covered by this report to partially satisfy Condition 4.
- 1.3. A copy of a memo between the CLO and Planning Officer has been provided which confirms that the response provided under P/2021/0519 still applies that further investigation is required in the soft landscaping areas.
- 1.4. Mr J. Williams has duly instructed SGP to undertake a Stage 2 Contamination Assessment at land off Lower Road Coedpoeth, Wrexham. A site location plan is provided below in Figure 1 and Drawing D01. Site details are:

Table 1.1: Site Details

Address	Nant Cottage, Lower Road, Coedpoeth, Wrexham, LL11 3TP
National Grid Reference	328250, 350855
Local Authority	Wrexham County Borough Council
Current Nature of Site	Undeveloped agricultural land
Site Access	Access from Lower Road, Coedpoeth
Proposed use	Detached dwelling, garage and landscaped areas
Planning Ref	P/2023/0138

Figure 1.1: Site Location



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- 1.5. This report describes the Stage 2 (intrusive) investigation undertaken by SGP in accordance with the partial requirements of Condition No. 4 (ref: P/2021/0519) and a brief agreed with the client. The assessment methodology follows the framework described in Environment Agency (EA) **Land Contamination: Risk Management Guidance**¹ which provides an overarching framework for the assessment and investigation of land contamination. It replaces the previous Contaminated Land Report 11: Model Procedures for the Management of Contaminated Land 2004.

Table 1.2: Planning Conditions relating to Land Contamination

Condition No 4 P/2021/0519	<i>'No development shall take place until a phased site investigation of the nature and extent of contamination has been carried out and submitted to and approved in writing by the Local Planning Authority. If any contamination is found during the site investigation, no part of the development shall commence until a scheme specifying the measures that will be taken to remediate the site to render it suitable for the development hereby permitted has been submitted to and approved in writing by the Local Planning Authority. The site shall thereafter be remediated in accordance with the approved scheme. If during the course of development any contamination is found that has not been identified in the site investigation, no further development shall take place on those parts of the site where that contamination has been found until an additional scheme of remediation has been submitted to and approved in writing by the Local Planning Authority for those parts of the site. The relevant parts of the site shall thereafter be remediated in accordance with the additional scheme of remediation.'</i>
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- 1.6. The study comprises a brief summary of previously obtained available information on the environmental setting of the site and the site's previous and current uses with respect to potential risks to the environment or human health. This report contains the results of additional investigations undertaken, a quantitative risk assessment and where appropriate and makes recommendations for intrusive investigations and remedial actions appropriate to the future use of the site.

¹ Land Contamination: Risk Management, issued 8th October 2020, last updated 19th April 2021, www.gov.uk

2. Information Sources

2.1. Previous Investigations

2.1.1. SGP carried out a Stage 1 (Desk Study) assessment of the adjacent site in April (Ref: R2259-R01-V1 07.04.2016). The results indicated that the site was generally at low risk of constraints to redevelopment associate with ground contamination, however the following issues required further assessment or remedial action:

- Provision of appropriate radon protection measures for new dwellings;
- Confirmation of the status of shallow soils on the site with respect to lead concentrations and co-contaminants zinc and cadmium.

2.2. Consultation

2.2.1. SGP understands that the report was submitted to WCBC for approval. SGP understand through correspondence with WCBC's Environmental Health Officer that the following site will be covered under the Phase 1 Contamination Assessment (ref: R2259-R01-v1) originally written for the adjacent site. The same recommendations were found to be applicable for both sites.

2.2.2. SGP received separate confirmation by email that the further investigation to characterise the soils on the site with respect to their metal content was required which should include other metals including nickel and that this information was required to discharge the condition prior to commencement of the development.

3. Ground Investigation Methodology and Results

3.1. Objectives and Rationale

3.1.1. The Stage 1 assessment identified the potential presence of elevated concentrations of heavy metals (principally lead, cadmium and zinc), within the shallow soils across the site.

3.1.2. It was therefore determined that representative soil samples should be collected from near-surface locations for chemical analysis of a range of metals / metalloids to inform the human health risk assessment for garden soils following redevelopment.

3.2. Fieldwork

3.2.1. The site investigation comprised 4 hand-dug trial pits to permit visual inspection of shallow strata and to obtain samples from the topsoil and shallow natural strata. Trial pit locations are shown on drawing 001. The investigation was undertaken on 26th May 2023 by SGP Senior Consultant S Miller and Graduate Consultant C McHugh.

3.2.2. Works involved:

- excavation of 4 trial holes (TP1-TP4) to depths of between 0.0m and 0.6m bgl (the locations of which are provided in Drawing D01);
- visual inspection of all soil arisings;
- collection of 4 soil samples from varying strata.

3.2.3. The hand-dug pits were backfilled immediately following excavation and sampling. All pits were extended reworked subsoils with occasional brick and rock fragments.

3.2.4. The sampling locations were positioned so as to provide representative information from the proposed garden areas at depths where future exposure of residents can reasonably be anticipated.

3.3. Chemical Analysis

3.3.1. All chemical analysis of soils was carried out by Eurofins Chemtest, Newmarket, working where possible to MCERTS and / or ISO 17025 accreditation. Soil samples (ref: 23-18184) were stored in appropriate containers as advised by the laboratory, placed in a cool box, and couriered to Eurofins, Chemtest within 72 hours of collection. Chain of custody documentation was completed and is retained by SGP.

3.3.2. Samples were analysed for arsenic, cadmium, copper, chromium (total and hexavalent), lead, mercury, nickel, selenium and zinc.

3.4. Field Observations

3.4.1. Thin concrete and gravel were fine to coarse, surrounded to angular including red brick and concrete fragments was present at the surface of all trial pit locations. Fragments of brick, slate

and concrete are believed to be derived from the construction works for the property which are currently taking place.

3.4.2. TP1 consisted of light brown, gravelly, sandy clay with occasional cobbles of brick and concrete.

The trial pit could only be extended 0.4m bgl due to the presence of a copper impregnated terram. It is understood this has been placed in relation to Japanese Knotweed treatment works that have previously been undertaken at the site.

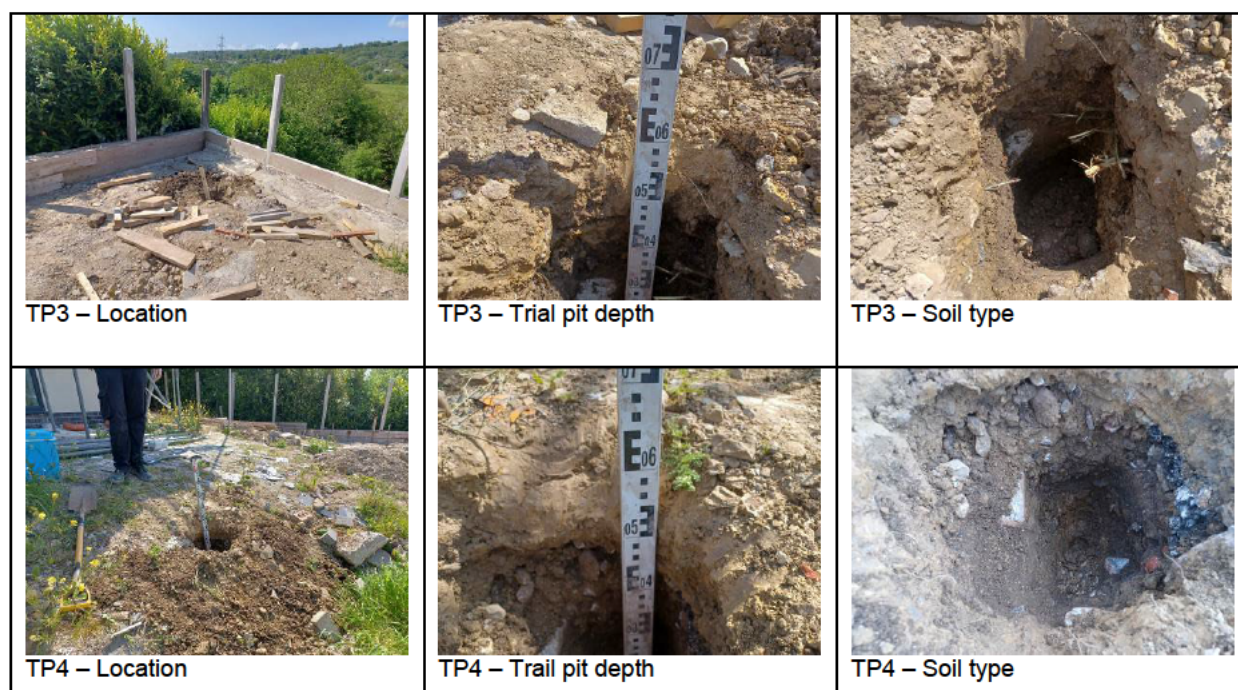
3.4.3. SGP understand that remedial measures have been undertaken to mitigate the risk of Japanese Knotweed previously identified on the site. The client advised that the Japanese Knotweed underwent treatment by specialist contractors followed by its removal and burial on site at a depth of approximately 8m bgl within welded shut containment. Following this, the entire site was covered by a copper impregnated terram to provide further protection above which site recovered soils have been placed.

3.4.4. Entries TP2 - TP4 consisted of brown to dark brown gravelly, sandy clay with frequent cobbles of brick and concrete, alongside occasional rootlets. Gravel was fine to coarse, sub rounded to angular with red brick and concrete fragments. Entries extended to 0.6m bgl, the observed ground conditions at each trial pit was consistent with reworked subsoils with occasional building debris present at the surface.

3.4.5. Soil samples were collected from the arising of TP1 from a depth of 0-0.4m and from TP2- 4 arisings at a depth of 0-0.6m.

Table 3.1: Site Photographs

		
TP1 - Location	TP1 – Trial pit depth	TP1 – Soil type
		
TP2 – Location	TP2 – Trial pit depth	TP2 – Soil type



3.5. Results of Soil Chemical Analysis

3.5.1. The complete soil analytical data are presented in Appendix A (ref: 23-18184) and are summarised below in Table 3.2.

3.5.2. The results of the soil analyses are compared to human health critical values (CVs) for initial screening purposes. The CVs adopted are appropriate to the environmental setting and proposed future residential with garden use of the site and are taken primarily from the “Suitable for Use” Criteria (S4ULs) published by LQM/CIEH², with the exception of lead which is adopted from the Category 4 Screening Level (C4SL). Assessment criteria are based on a residential land use with plant uptake which is most applicable to the end use of the Site.

3.5.3. A summary of the results compared to the adopted screening criteria is presented below:

Table 3.2: Summary of Soils Analysis

Contaminant	Number of Samples	Range of Concentrations (mg/kg or indicated)	Soil standard adopted and concentration (mg/kg or indicated)	Exceedances
Arsenic	4	3.9-5.8	37	None
Cadmium	4	<0.1	11	None
Chromium (total)	4	14-23	910	None
Copper	4	18-25	2400	None
Lead	4	22-200	200	None
Mercury (inorganic)	4	<0.05-0.09	40	None

² Copyright Land Quality Management Ltd, reproduced with permission; Publication Number S4UL3102. All rights reserved

Contaminant	Number of Samples	Range of Concentrations (mg/kg or indicated)	Soil standard adopted and concentration (mg/kg or indicated)	Exceedances
Nickel	4	17-30	130	None
Selenium	4	<0.25	250	None
Zinc	4	62-240	3700	None

3.5.4. No exceedances were reported although it is noted that the sample from TP3 reported a concentration of 200 mg/kg.

4. Updated Conceptual Model and Risk Assessment

4.1. Methodology

4.1.1. Information from the desk study and site investigation has been used to identify the likely source-pathway-target relationships that may exist at the site during and following the proposed development. Principal factors that may determine potential sources of contamination at the site, receptor vulnerability and potential pathways have been identified and each assessed in turn to revise the Conceptual Site Model (CSM).

4.2. Sources of Contamination

4.2.1. No exceedances of heavy metals were reported but it is acknowledged that lead concentrations within TP3 were at the C4SL threshold (200 mg/kg) for residential soils. It is also noted that made ground soils consisting of re-worked natural soils within inclusions of brick and concrete from the on-going construction works were reported within the shallow ground. Inclusions of ash, clinker, slag or bitumen materials were not observed but it is recognised that a wider testing suite which would be typical if made ground soils were present were not undertaken.

4.3. Revised Risk Assessment

4.3.1. The presence of lead at the residential screening criteria of 200 mg/kg does not pose a risk to human health but given the limited number of samples and the presence of re-worked natural soils with anthropogenic inclusions there is potential that exceedances could be present.

4.3.2. It is also acknowledged that sampling undertaken on the neighbouring site reported exceedances of lead (maximum of 1,133 mg/kg) and whilst not reported on site to date, there is no readily explanation as to why such concentrations should not be present on site. It is therefore considered that a precautionary approach should be adopted with regards to the potential risk to human health.

4.3.3. Lead is not present in the shallow soils at concentrations considered likely to pose an acute risk to construction workers providing good working practices and occupational hygiene are maintained.

4.3.4. The typical form of metal mineralisation in the area is highly insoluble metal sulphides such as galena and sphalerite, indicating that leaching and water pollution from the site is likely to be insignificant, particularly in the context of the surrounding area. The concentrations of zinc and copper within the shallow soils are unlikely to pose a risk to plant growth.

5. Conclusions and Recommendations

Conclusions

- 5.1. A Phase 1 Desk Study (ref. R2259-R01-v1) has been produced for the neighbouring site and has been submitted as part of the planning submission for this Site. The report was duly accepted by the CLO and the recommendations for a limited site investigation due to the potential risk from elevated metals (lead, cadmium and zinc) were implemented.
- 5.2. Four hand-dug trial-pits (TP1-TP4) were excavated across accessible areas of the Site and also targeted the potential garden / landscape areas. Ground conditions reported a re-worked natural clay with inclusions of brick and concrete which are considered to be attributed to the constructions works which were taking place on the Site. No inclusions of ash, clinker, slag or bitumen products were observed.
- 5.3. Samples were collected from each trial-pit and submitted for a metal test suite which included the main contaminants of concern, lead, cadmium and zinc. Concentrations were compared to generic assessment criteria based on a residential land use. No exceedances were reported, however the sample from TP3 reported a lead concentration of 200 mg/kg which is the same as the adopted criteria. Whilst this is not an exceedance it does suggest elevated lead may be present.
- 5.4. Given the presence of reworked natural soils, minor elevated lead (although no exceedances) and that a previous investigation for the neighbouring site reported elevated lead where there's no readily explanation to suggest why such concentrations would not be present on the site then it is considered that remedial works should be undertaken, particularly given the high-sensitivity end use of the site.

Recommendations

- 5.5. It is recommended that a clean 600mm soil cover system is implemented across all landscape and garden areas, this is a consistent approach with that adopted for the neighbouring site.
- 5.6. A Remediation Strategy should be produced detailing the verification of the soil cover system including testing volumes of imported soils and depth validation to confirm that a suitable thickness (600mm) of soil has been placed.
- 5.7. The proposed remedial measures would be limited to landscape and garden areas only and would not be applicable to areas of hardstanding (driveway, patio, paths) or the dwelling.

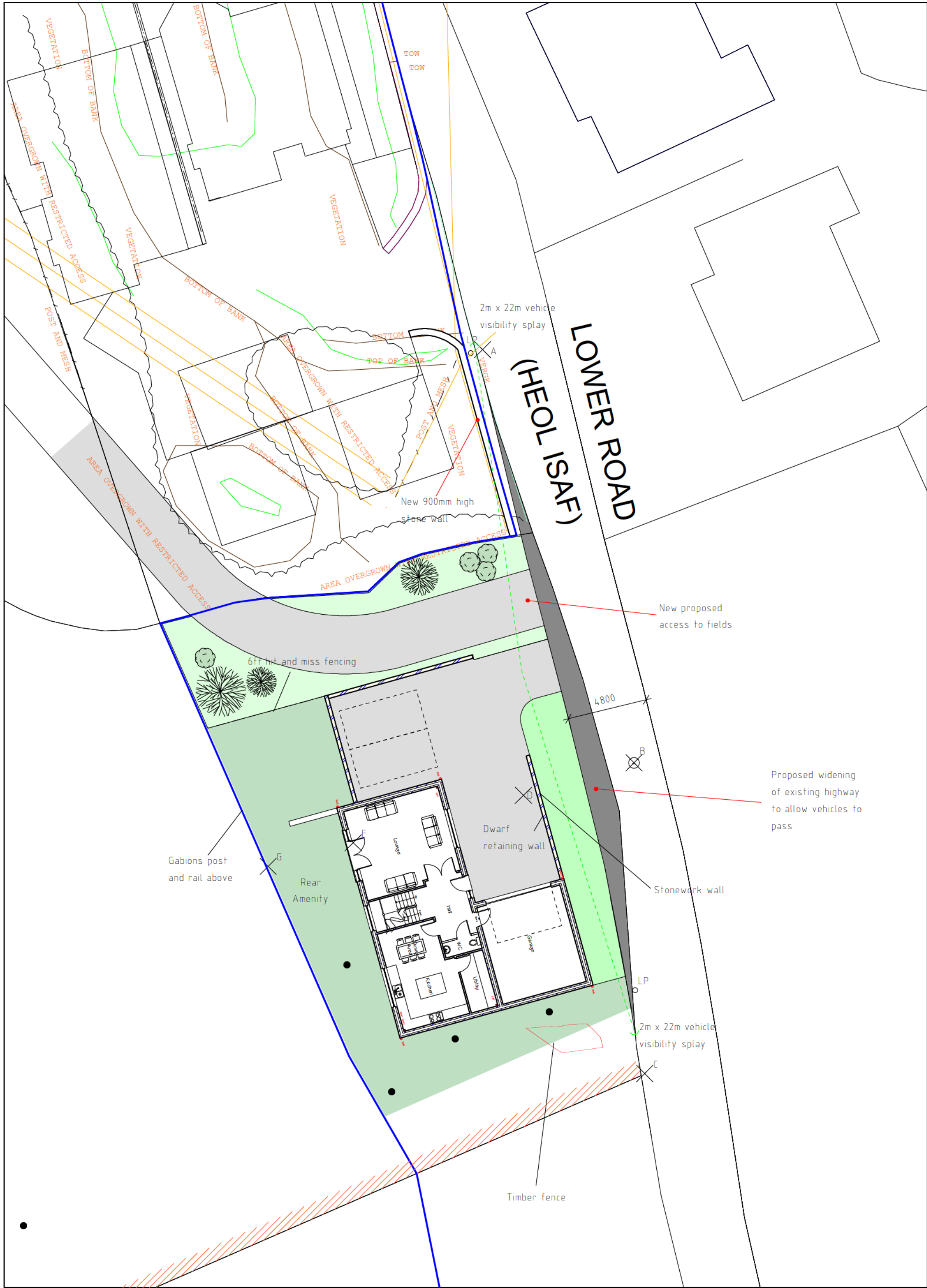
Limitations

- 5.1. SGP reserves the right to alter any of the foregoing information in the event of new information being disclosed or provided and in the light of changes to legislation, guidelines and responses by the statutory and regulatory authorities.

- 5.2. This report has been prepared by Smith Grant LLP, for the sole and exclusive use of Mr Mark Davies. The benefit of this report may not be assigned to any other party without the prior agreement in writing of Smith Grant LLP. Reasonable skill, care and diligence have been exercised within the timescale and budget available, and in accordance with the technical requirements of the brief.
- 5.3. Notwithstanding the efforts made by the professional team in undertaking the assessment and preparing this report, it is possible that other ground conditions and contamination as yet undetected may exist. Reliance on the findings of this report must therefore be limited accordingly. Such reliance must be based on the whole report and not on extracts which may lead to incomplete or

DRAWING D01

Sampling Locations



Site Plan 1:200

APPENDIX A

Analytical Results



2183

Final Report

Report No.: 23-18184-1

Initial Date of Issue: 06-Jun-2023

Re-Issue Details:

Client Smith Grant LLP

Client Address: Bryn Estyn Business Centre
Bryn Estyn Road
Wrexham
LL13 9TY

Contact(s): Caitlin McHugh
Scott Miller

Project R3213 Coedpoeth

Quotation No.: **Date Received:** 01-Jun-2023

Order No.: **Date Instructed:** 01-Jun-2023

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 07-Jun-2023

Date Approved: 06-Jun-2023

Approved By:



Details: Stuart Henderson, Technical
Manager

Results - Soil

Project: R3213 Coedpoeth

Client: Smith Grant LLP	Chemtest Job No.:				23-18184	23-18184	23-18184	23-18184
Quotation No.:	Chemtest Sample ID.:				1648277	1648278	1648279	1648280
Order No.:	Client Sample Ref.:				TP1	TP2	TP3	TP4
	Client Sample ID.:				S1	S1	S1	S1
	Sample Type:				SOIL	SOIL	SOIL	SOIL
	Date Sampled:				26-May-2023	26-May-2023	26-May-2023	26-May-2023
Determinand	Accred.	SOP	Units	LOD				
Arsenic	U	2455	mg/kg	0.5	3.9	4.4	5.8	3.9
Cadmium	U	2455	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chromium	U	2455	mg/kg	0.5	23	21	17	14
Copper	U	2455	mg/kg	0.50	21	21	25	18
Mercury	U	2455	mg/kg	0.05	< 0.05	0.06	0.09	0.06
Nickel	U	2455	mg/kg	0.50	30	21	18	17
Lead	U	2455	mg/kg	0.50	22	180	200	120
Selenium	U	2455	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25
Zinc	U	2455	mg/kg	0.50	62	190	240	240

Test Methods

SOP	Title	Parameters included	Method summary
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com