

Report No	Date
22177/R1	June 2023
Project	CWMAVON – GEOTECHNICAL REVIEW OF EXISTING WORKS
Client	TRJ

**Spectrum Geo Services
Foxglove Cottage,
Cwm Risca Lane,
Tondy,
BRIDGEND
CF32 0EH**

Report No:	Date:
22177/R1	June 2023

Project:
CWMAVON – GEOTECHNICAL REVIEW OF EXISTING WORKS

Issue Number	Status	Description of Amendments
1	Draft	

Report prepared by:
Signed

This report is provided for the benefit only of the party to whom it is addressed. Spectrum Geo Services do not extend responsibility to any third party for the whole or any part of the contents. Spectrum Geo Services owes no duty of care in relation to this report to any third party. The investigation and reportage has been undertaken with all reasonable skill, care and due diligence. Spectrum Geo Services disclaims any responsibility to the client or others in respect of any matter(s) outside this agreed scope of the above works.

CONTENTS

i

1.0 INTRODUCTION.....	4
1.1 Instruction	4
1.2 Introduction.....	4
2.0 SUMMARY OF FINDINGS	6
2.1 Desk Top Study.....	6
2.2 Phase 2 Ground Investigation	7
2.3 Geology	8
2.4 Coal Mining Risk Assessment (CMRA).....	8
2.5 Ground Contamination.....	8
2.6 Ground Gas	9
2.7 Tetra Tech Conclusions.....	9
10	
3.0 CONCLUSIONS	11
APPENDIX 1.....	12
Development Plans.....	12

1.0 INTRODUCTION

1.1 Instruction

Spectrum Geo Services (SGS) were commissioned by TRJ Ltd. to complete a review of existing GI data at a site at 91 Waun Wen Road, Cwmafan, Port Talbot, SA12 9ED.

The site is located approximately 2.85km north of Port Talbot. The site is approximately 0.168ha in area and is centred on National Grid Reference (NGR) 278512, 192486. The approximate postcode of the site being SA12 9ED.

1.2 Introduction

It is understood that the site is to be developed as centre of education, with a new building and associated car parking.

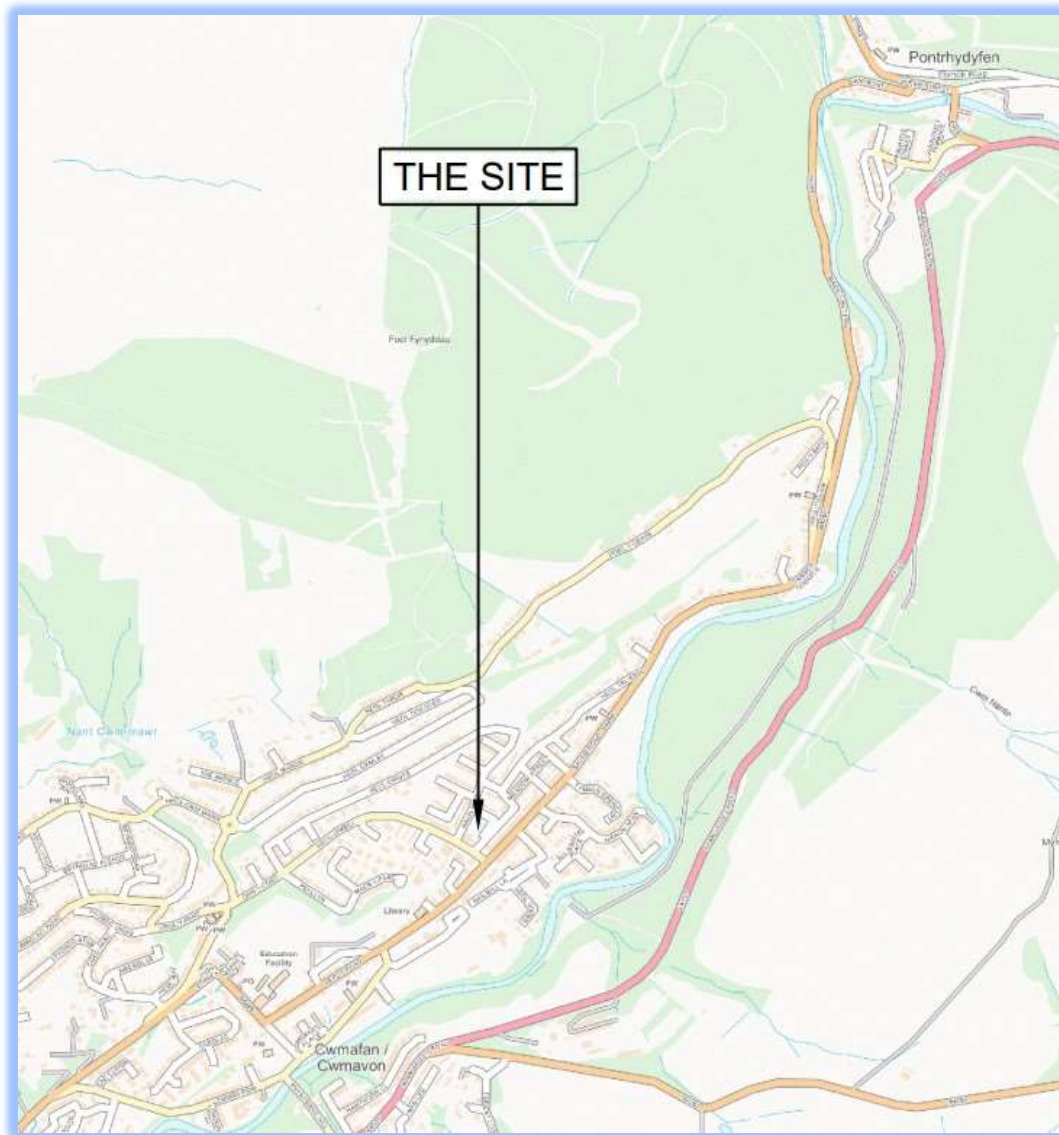


Figure 1: Site Location

2.0 SUMMARY OF FINDINGS

A previous Desk Study and Ground Investigation have been undertaken for Neath Port Talbot CBC, by Socotec and Tetra Tech respectively;

- Childcare Unit Cwmavon, Desk Study and Field Reconnaissance. Report H1060-21, January 2022. Socotec.
- Cwmavon Ground Investigation Report. 784-B035234, July 2022. Tetra Tech.

2.1 Desk Top Study

The SOCOTEC desk top study (DTS) and field reconnaissance report (Report No. H1060- 21) supplied by Neath Port Talbot County Borough Council outlined the following summary of the sites and its key risks.

The site is located adjacent to a former copper works and is shown on the historical mapping of the site (circa 1880) as well as a coal pit, coke ovens and gas works located to the west of the site. The eastern portion of the site historically consisted of gardens associated with the residential properties on Cunard Row. A number of tramways are also identified within the north west site boundary. By the 1920-1930s the tramway and an associated slag heap are labelled as disused and the residential properties of Cunard Row have been demolished. Re-profiling and restoration was undertaken in the 1970s and by the end of the decade the new residential properties of Waun Wen have been built and the area of the existing car park developed. These features persist today.

A mineshaft (7m north of the site boundary) and coal outcrop running through the site were identified during the DTS and represent two of the main risks associated with the redevelopment of the site and which the ground investigation has been commissioned to resolve. Due to the coal mining legacy issues there is a medium to high risk of geotechnical hazards associated with the site and the historic industrial setting suggests a low to moderate risk of geo-environmental hazards.

The DTS also suggests that current and historic land uses will be sources of contamination including car parking, hard standing past mining, former tramways and former slag heaps.

2.2 Phase 2 Ground Investigation

Subsequently, Tetra Tech undertook a Phase2 Ground Investigation.

The site investigation was undertaken between 16th and 19th May 2022. The scope of the investigation specified by Neath Port Talbot Council is based on the desk top study undertaken by SOCOTEC Report No. H1060-21 and included the following:

- Geophysical survey to locate mineshaft shown to be north of the site and outside the red line boundary.
- Clearance of buried services prior to excavation and the location and level of each exploratory hole location surveyed.
- Two combined dynamic sample, rotary core and rotary open hole boreholes to a depth of 30metres, with sampling and SPTs in the upper 10metres.
- Two days of windowless sampling to five metres, or refusal, with SPTs and samples.
- One day of soakaway testing in two trial pits not exceeding 1.5metres depth.
- Five TRL DCP test locations to obtain indicative CBR values around the site.
- Installation of gas/groundwater monitoring standpipes within the one borehole and two windowless samples and three return visits to measure gas/groundwater levels.
- On-site inspection and logging of recovered samples.
- Representative soil samples taken and submitted for geotechnical classification testing.
- Representative soil samples submitted and tested for a suite of potential contaminants

2.3 Geology

The sequence of strata encountered by Tetra Tech beneath the site comprised;

- Made Ground
- Superficial Alluvium Deposits
- South Wales Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone).

2.4 Coal Mining Risk Assessment (CMRA)

The risk assessment indicates that there is a Low to Moderate Risk of ground instability as a result of a recorded mine entry (shaft) being present on the northern site boundary. The nature of the backfill and cap is defined in the consultant's coal mining report and the location confirmed by Tetra Tech by the use of geophysical methods. A development exclusion zone was recommended to be placed around the mineshaft location.

The risk assessment indicates that there is a Low Risk of ground instability as a result of deep or shallow recorded/unrecorded mining and mining geology beneath the site. Following the drilling of two rotary openhole boreholes no workings were encountered in the Lower Nine Foot Top Leaf seam, in the eastern portion of the site.

2.5 Ground Contamination

The results of the Tetra Tech laboratory testing have indicated elevated Arsenic in two samples (WS04 and TP01) in Made Ground at concentrations which pose a potential risk to human health. The results have also indicated elevated heavy metal and PAH concentrations in soil derived leachate testing at concentrations which pose a potential risk to underlying groundwater. Due to access constraints (parked cars during monitoring) groundwater sampling could not be undertaken and as such the potential impact to groundwater cannot be discounted.

Based on the significant thickness of Made Ground noted across the site associated with the substantial industrial historical land use on site, the potential for localised previously unidentified contamination cannot be discounted.

2.6 Ground Gas

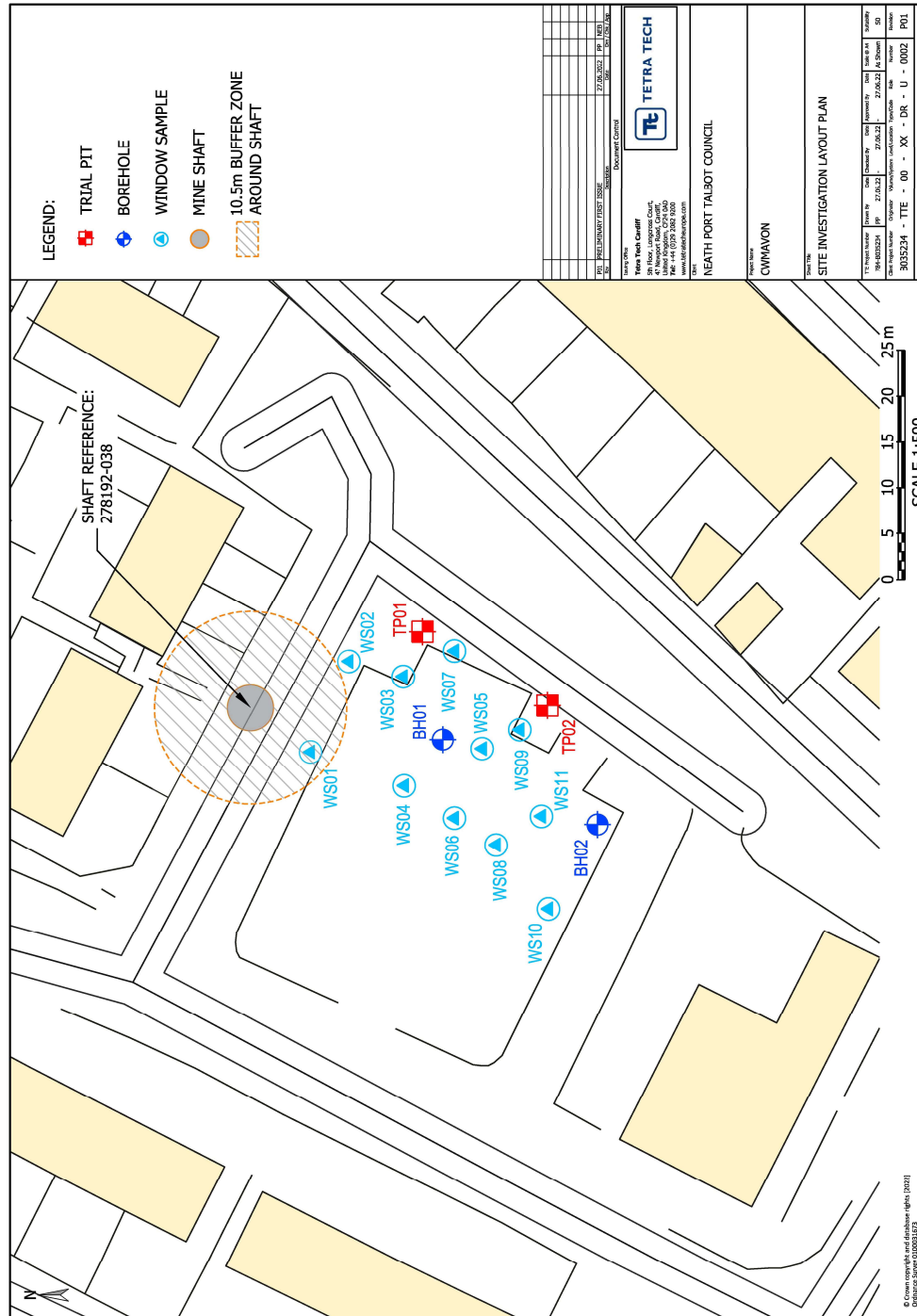
Ground gas monitoring indicates the site is representative of CS2 (Low Risk) due to the identification of elevated concentrations of carbon dioxide.

Basic ground gas protection measures will be required in all new developments on the site.

2.7 Tetra Tech Conclusions

Based on the findings of the ground investigation, the following recommendations are outlined:

- Given the thicker made ground in the northern site area and the exclusion zone required around the historic mineshaft, switching the development around with the car park in the north and childcare unit in the south will potentially be a better option from a geotechnical perspective.
- A groundwater sample should be obtained from BH02 to assess the impact to groundwater from the overlying Made Ground;
- In the event that soft landscaping/ grass cover is proposed on the site (particularly in the external play area) the area will require capping with a minimum thickness of 600mm of clean, imported capping material to provide a suitable barrier between the identified contamination and potential site users;
- A Reactive Strategy should be developed for the site to outline the requirements for identification, assessment and management of any areas of previously unidentified contamination encountered during the development phase;
- Movement of materials on the site should be undertaken in conjunction with a Materials Management Plan in line with the recommendations in the CL:AIRE Code of Practice to confirm any materials utilised on site are geotechnically and chemically suitable for re-use and to ensure all materials leaving site are disposed of at a suitable waste disposal facility;
- It remains the responsibility of the contractor as waste producer to classify any waste materials and identify a suitable off site disposal facility.



3.0 CONCLUSIONS

3.1 Introduction

SGS have undertaken a review of the existing data. Herein we present our opinion of the findings of the previous works and any data gaps within.

3.2 Findings

Fundamentally, the location of the proposed building has changed since the Phase 2 Ground Investigation was undertaken. This is presumably to ensure that the building does not fall within the zone of influence of the proven mineshaft.

Thus, it is recommended that further GI works are undertaken at the new footprint to confirm the design assumptions.

This will require trial pitting, window sampling and rotary boreholes.

The trial pitting and window sampling will allow assessment of foundation options and the risk of contamination which may differ to that in the east of the site.

Importantly, further rotary drilling in the footprint is required to ensure that there are no workings in the Lower Nine Foot Top Leaf Seam.

SGS are not convinced that the CMRA presented will satisfy the Coal; Authority, so it would be worth asking NPT if the CMRA has been commented in by the CA.

A water sample from BH02 can be taken at the time of the additional investigations.

Additional chemical testing will also partly aid the development of a reactive strategy.

APPENDIX 1

Development Plans

