

# Earth Science Partnership

Consulting Engineers | Geologists | Environmental Scientists

33 Cardiff Road, Taff's Well, CARDIFF, CF15 7RB ☎ 029 2081 3385  
✉ [enquiries@earthsciencepartnership.com](mailto:enquiries@earthsciencepartnership.com) [www.earthsciencepartnership.com](http://www.earthsciencepartnership.com)



## Godre'r Graig Primary School Executive Summary; Preliminary Investigation and Additional Assessment

Prepared for:

Neath Port Talbot County Borough Council  
The Quays, Baglan Energy Park,  
Brunel Way, Briton Ferry,  
SA11 2GG



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0	Draft	March 2020	M Elcock	M Eynon
1	Final	March 2020	BEng (Hons) FGS	BSc (Hons) MSc CGeol EurGeol FGS RoGEP Specialist
Signatures:				
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## 1 Introduction

Neath Port Talbot County Borough Council (NPTCBC), hereafter known as the Client, instructed ESP to develop this Executive Summary on a Preliminary Investigation and Additional Assessment of a Quarry Spoil Tip on the slopes above Godre'r Graig Primary School (the School), located in the Tawe Valley.

The full report should be viewed for details, reference ESP.7234e.02.3302.

Previous assessments have shown that there was a risk to the school from a Quarry Spoil Tip and this Executive Summary provides a brief overview of the outcomes of further assessment work.

## 2 Ground Model

The investigation allowed the Ground Model, as shown in Figure 2, to be updated and the below provides a summary of the findings.

The Quarry Spoil Tip was found to comprises two separate strata, both are classed as Coarse Discard, i.e. generally cobbles and gravel of sandstone, but there is a lower unit with a higher fine-grained component (clay, silts). Below the Quarry Spoil, Glacial Diamicton has been found which overlies weathered and intact bedrock.

Groundwater has been observed in the Quarry Spoil Tip and monitoring has shown a variable head of water in the tip.

Ground movement monitoring equipment has shown no significant movement of the tip to date; however, monitoring should be continued.

## 3 Preliminary Slope Stability Assessment

Slope stability assessment has been undertaken to assess the Factor of Safety (FoS) within the Quarry Spoil Tip. The FoS is simply the ratio of disturbing forces against restoring forces and gives a simple indication to stability.

After some careful selection and refinement of appropriate material parameters, the Slope Stability modelling has shown that the slope is 'marginally stable', which is likely to represent the current condition, as the material would have been 'end tipped' and reached a state of stability on the hillside. This assessment broadly aligns with the medium risk assigned to the Quarry Spoil Tip on our previous report (ESP 2019).

The slope stability assessment showed that the tip stability was variable with a variable head of water. Typically, higher the water level the stability decreased, and vice versa.

In order to put the stability assessment into context, broad definitions to describe a slopes stability are described below:

- **Stable** – the margin of stability is sufficiently high to withstand all destabilising forces;

- **Marginally Stable** – likely to fail at some time in response to destabilising forces reaching a certain level of activity; and
- **Actively unstable** – slopes where destabilising forces produce continuous or intermittent movements.

Although the assessment has shown that the Quarry Spoil Tip is marginally stable, this is below what would be expected for a slope if it were to be constructed to modern day engineering standards given the high risk to life if failure were to occur.

## 4 Discussion of Remedial Options

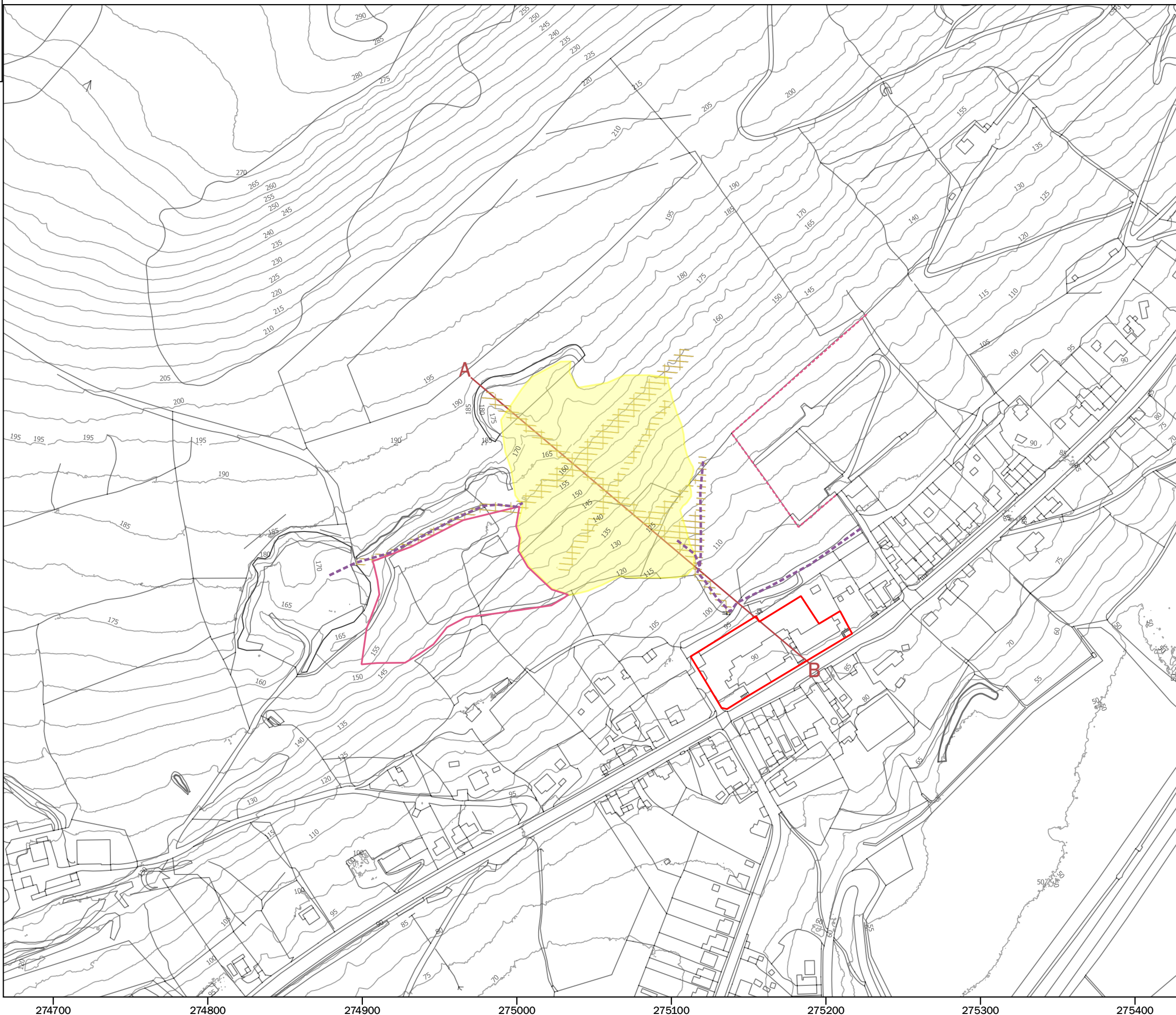
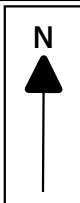
Risk management or mitigation options were considered and following an assessment using a semi-quantitative scoring system. Each mitigation option (discussed further in the main report) were scored for effectiveness, durability, practicability, sustainability and cost. The scoring system was given +1, for a positive impact, 0 (or zero) for a neither negative or positive impact and a -1 for a negative impact, all relative to the other options.

The risk management or mitigation options that score the highest are:








- Close the school such that the tip no longer represents a risk to school users, 1 point; or
- A combined approach of incorporating drainage to create betterment only, install monitoring points and produce warning system, 2 points.

The assessment showed that removing the tip to landfill or some combination of hard engineered structure(s) are unlikely to be favourable.

## End of Executive Summary



**Key**

-  GrG Primary School Boundary
-  ESP Spoil Tip Extent
-  Extended Tipping Area
-  Vegetation Clearance Area
-  Access Tracks
-  Cemetery Wall
-  Line of Section A - B

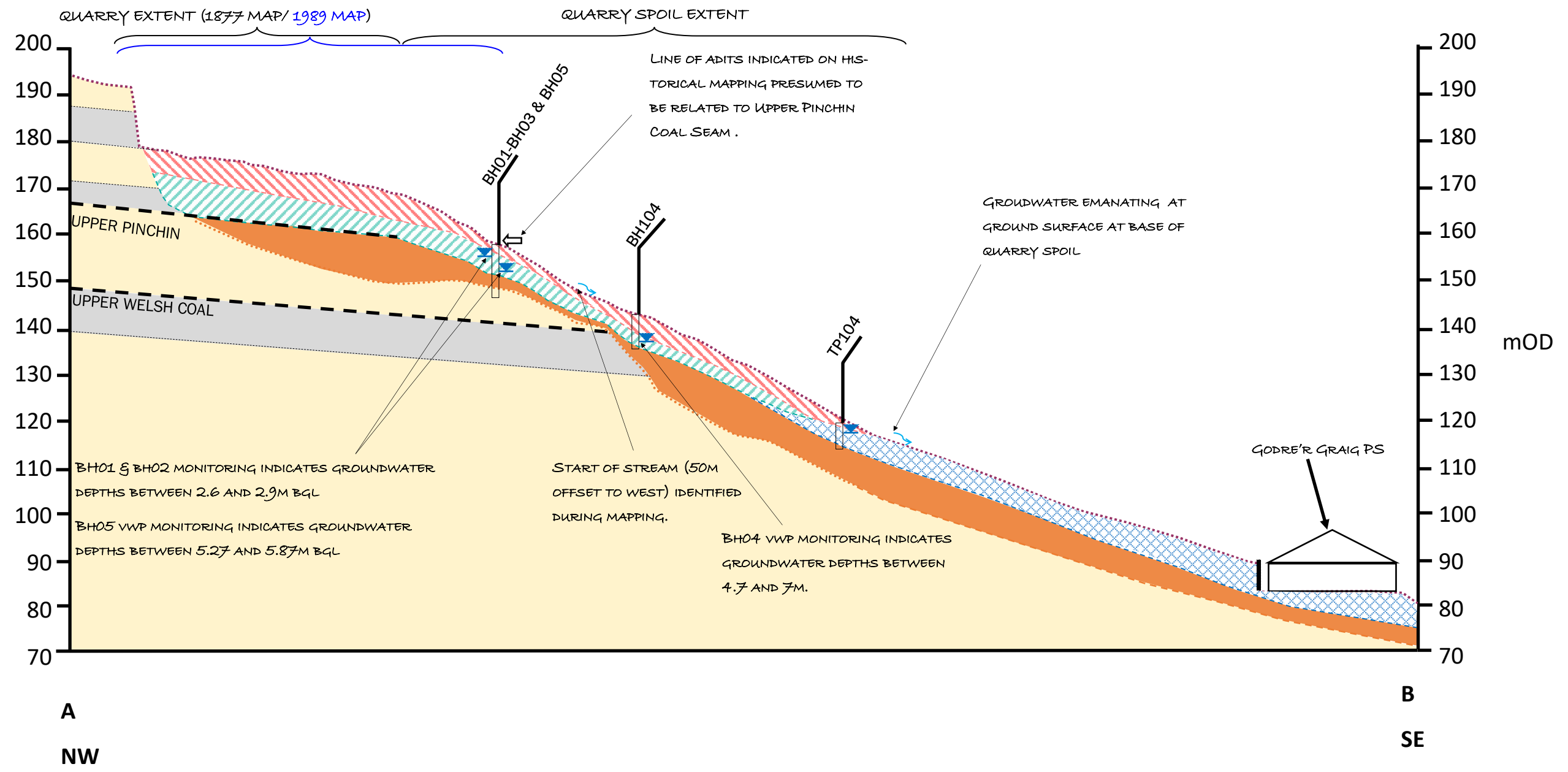
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**SCALE:** 1:2,500 (approx. @ A3)

**PROJECT:**  
Godre'r Graig Primary School

**FIGURE 1:**  
Site Features Plan

**EARTH SCIENCE PARTNERSHIP**  
33 Cardiff Road, Taffs Well,  
Cardiff CF15 7RB Tel: 029 2081 3385  
enquiries@earthsciencepartnership.com



**Key**

- |                          |                                       |                      |                   |
|--------------------------|---------------------------------------|----------------------|-------------------|
| Llynfi Member— Sandstone | Made Ground - Coarse Discard (Coarse) | Ground Surface       | Spring            |
| Llynfi Member—Mudstone   | Made Ground - Coarse Discard (Fine)   | Coal Seam (Inferred) | Groundwater Level |
| Weathered Bedrock        | Probable Glacial Diamicton            | Boundary (Inferred)  |                   |

PROJECT: Godre'r Graig Primary School

SCALE: 1:1000 (approx. at A3)

FIGURE 2: Conceptual Ground Model



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