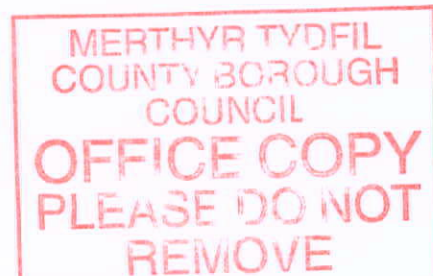


Report No. BC/MB/10.15.04.

160060



Stability Report on Land at Glyndyrus Close, Abercanaid, Merthyr Tydfil.



Prepared on behalf of:

Miss Monica Marshall

By:



BLANDFORD CONSULTING

Report No. BC/MB/10.15.04.

Stability Report on Land at Glyndyrus Close, Abercanaid, Merthyr Tydfil.

Prepared on behalf of:

Miss Monica Marshall

By:

BLANDFORD CONSULTING

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Stability Report on Land at Glyndyrus Close, Abercanaid, Merthyr Tydfil.

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Drawing No:		Scale:
<i>BC/MB/10.15.04.01.</i>	<i>General Location Plan.</i>	<i>1:50,000.</i>
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<i>BC/MB/10.15.04.06.</i>	<i>Extract from Ordnance Survey (1919 Edition).</i>	<i>1:2,500.</i>

Stability Report on Land at Glyndyrus Close, Abercanaid, Merthyr Tydfil.

1 Introduction

This report has been prepared on behalf of our client:

*Miss Monica Marshall,
Quay Row,
Abercanaid,
Merthyr Tydfil,
CF48 1YP*

and relates to a parcel of land, 'the Site', at Glyndyrus Close in Abercanaid, where it is proposed to erect a Park Home. The planning permission for the development (P/14/0269) includes a condition that requires an assessment to be made of the stability of the land prior to any building works taking place. A Park Home has no permanent foundation and so discussions took place with Mr Gerald Coughlan at Merthyr Tydfil CBC's Engineering Department to agree the scope of the report. The Site is considered to be stable and it is recommended that the Park Home is located a short distance back from the top of the main, southern slope of the Spoil Heap on which the Site is located.

The following sources of data were used in the compilation of this report:

- i) Research of published geological records;*
- ii) Research of mining records held at The Coal Authority's archive in Mansfield;*
- iii) A walkover survey of the Site and*
- iv) the archive records of Blandford Consulting.*

The findings of this report are necessarily based upon the data used in its compilation and may be amended in the future in the light of additional material information. The report must only be used in its entirety for its stated purpose.

/Cont....

2 Brief Description of the Site

The parcel of land which is the subject of this report ('the Site') is situated at Upper Abercanaid and lies approximately 5 kilometres (km) south of the centre of Merthyr Tydfil (see Figure 1 and *General Location Plan, drawing no. BC/MB/10.15.04.01*). The Site, itself, is situated on the south-westerly facing slopes of the valley of the River Taff. A small cluster of dwellings at Quay Row and Glyndyrus Close form the southern, eastern and north-eastern boundaries of the Site, beyond Glyndyrus Close is a large industrial area. The A 470 (T) forms the western boundary of the Site and beyond it is countryside. The Site itself is part of a disused colliery spoil heap and is irregular in outline (see *Detailed Location Plan, drawing no. BC/MB/10.15.04.04*), but the Park Home will occupy only a small area of the land that benefits from the planning permission. Apart from the sloping access road, the Site is fairly level and is at an approximate elevation of 171m aod (see Figure 2).

Figure 1
Aerial View of Site



/Cont....

Figure 2
Site Showing Location for Park Home



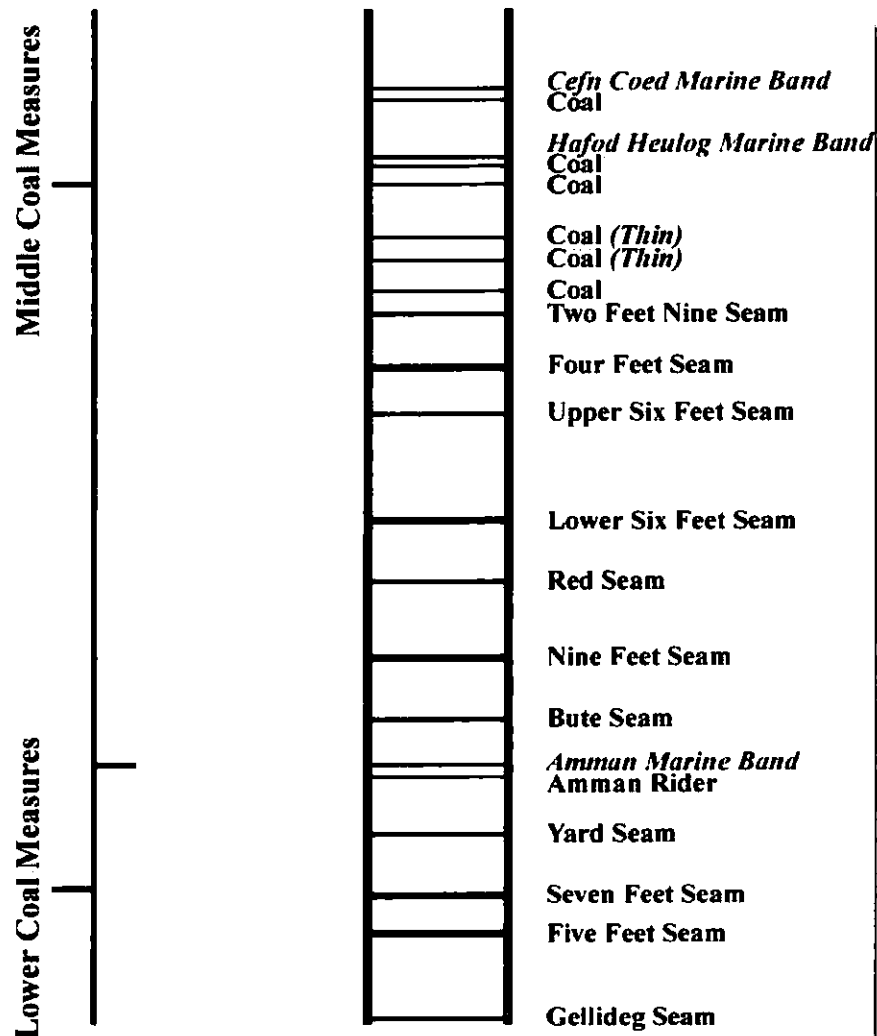
3 Geology of the Site

The Site is situated fairly centrally towards the northern margin of the South Wales Coalfield so that it is underlain at shallow depths by strata assigned to the Middle Coal Measures (see *Geology Plan, drawing no. BC/MB/10.15.04.02*). The most recently published geological sheets (SO 00 SW and SO 00 SE at 1:10,560 scale) show the inferred position of the outcrop of the Lower Six Feet Seam to be present immediately to the south of the Site and the inferred position of the outcrop of the Nine Feet Seam is shown 150m north of the Site. The outcrops approximately follow an east-west trend across the Taff Valley. The dip of the strata in the area is of the order of 1 in 13 towards the south-east, so that the Nine Feet Seam underlies the Site but the Six Feet Seam does not.

The published geological sheet for this area shows the measures to be covered with deposits of glacial boulder clay. Published information also indicates that the Site is not affected by landslip.

/Cont....

Figure 3
Indicative Stratigraphic Column.
 Scale: Not to Scale.



The published geological sheet also shows Made Ground to be present across the Site; the local topography indicates that the Made Ground is a disused colliery spoil heap. This assessment is a desk top study so that no intrusive investigation has been carried out during the course of the study. However, trial pits excavated elsewhere on the same body of Made Ground during an adjacent development found the Made Ground to be comprised of a moderately compact, mottled dark grey, silty, fine, medium and coarse sandy, very gravelly clay. The gravel fragments were found to be angular and sub-angular in shape, of fine, medium and coarse size and consisting of shale, sandstone, occasional slag and coal, *i.e.* fairly typical colliery spoil.

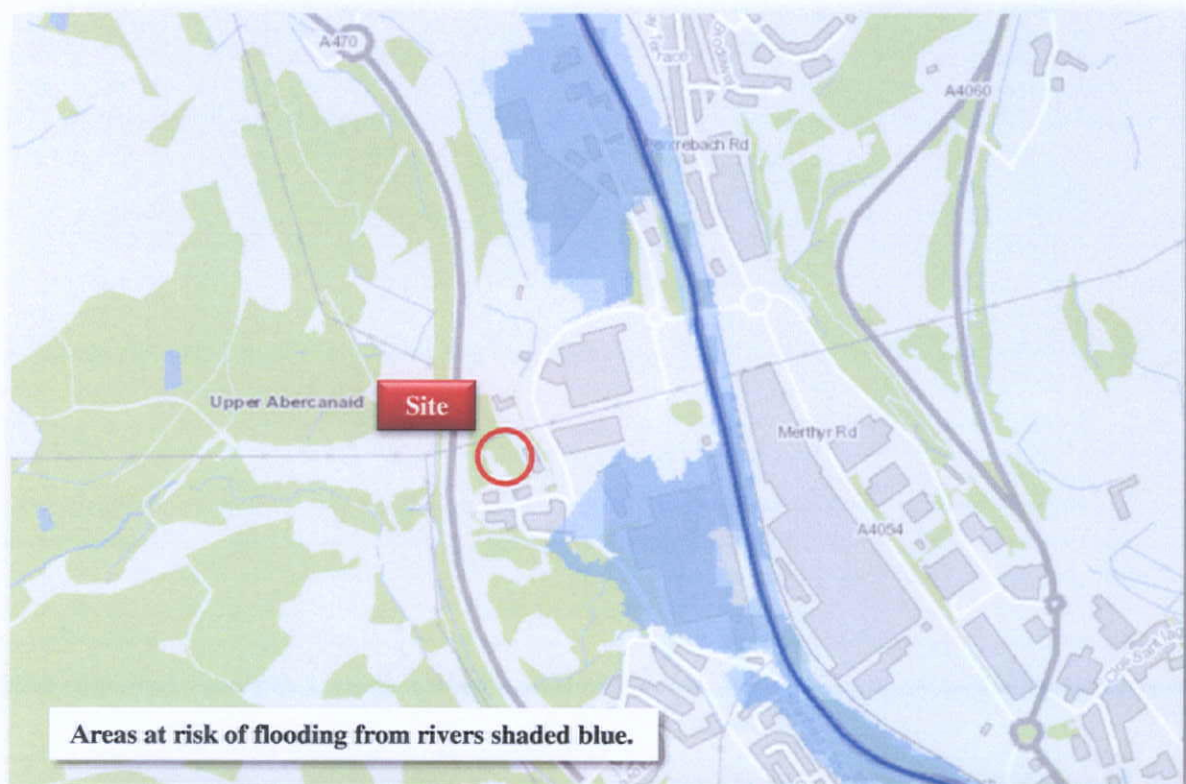
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4 Hydrology and Hydrogeology

4.1 Hydrology

There are no bodies of standing water on the Site and it is not in an area at risk of flooding from rivers. The River Taff, flowing in a north-south direction, lies approximately 400m to the east of the Site.

Figure 4
Areas at Risk of Flooding from Rivers



Screenshot from NRW Website captured 16.11.2015.

4.2 Hydrogeology

The Groundwater Vulnerability Map for the area, published jointly by the Environment Agency, British Geological Survey and the Soil Survey and Land Research Centre, identifies the local geology as a minor aquifer having an intermediate permeability (see *Groundwater Vulnerability Map, drawing no. BC/MB/10.15.04.03*). The Site is not located above a major aquifer or spring line.

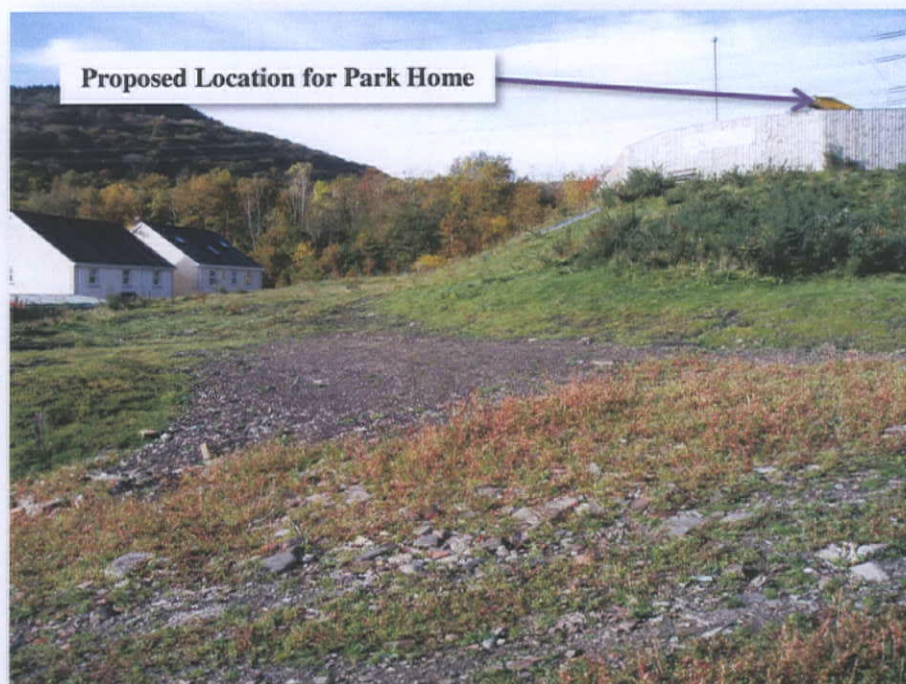
/Cont....

5 Stability of the Site

The Site occupies a level area on the top of a disused colliery spoil heap together with a narrow, sloping access road down the eastern side of the spoil heap, leading to the public highway at Quay Row. A walkover survey of the Site found the front face of the spoil heap to be at an average slope angle of 22° , less than the typical angle of repose for loose tipped colliery spoil material of the above described nature. There was no obvious sign of bulging or heave in the southern, main face of the spoil heap that would indicate that the slope was unstable and no evidence of tension gashes along the top of the slope.

Spoil heaps can become less stable if the pore water pressure within the heap increases. No evidence was seen of running water entering the top of the spoil heap and no evidence was seen of seepages through the slopes of the spoil heap or at the toe of the main slopes. There is no body of standing water on the spoil heap.

Figure 4
Southern Front Face of Spoil Heap



/Cont....

Shallow mine workings underlying a spoil heap can potentially lead to a reduction of stability if the old workings collapse to the base of the spoil heap, altering the topography on which the spoil heap rests. The shallowest seam underlying the Site that is capable of supporting underground mining operations is the Nine Feet Seam. Basal contours for the Nine Feet Seam on the geological sheet show that the Seam is at an elevation of 122m aod beneath the Site, so that the thickness of cover above the Seam is approximately 47m. Exploratory drilling carried out on land immediately to the south of the Site found the Boulder Clay to vary in thickness up to 8m. Assuming the spoil heap to be 8m high (cf Figure 4), the rock cover above the Nine Feet Seam below the spoil heap is of the order of 31m. It is generally accepted that the upward collapse of mining voids through the measures chokes off when the strata: void ratio is 10:1. A 2m high mining void in the Seam would have a strata: void ratio of 15:1, resulting in a negligible risk of a collapse reaching the base of the spoil heap that might reduce its stability. Old workings that might be present in seams below the Nine Feet Seam present no risk of collapse to the base of the spoil heap. There are no active coal mines in the locality, either deep mines or opencast, that could affect the stability of the spoil heap and the Site has not previously been part of an opencast coal site.

Disused mine entries beneath or in the immediate vicinity of a spoil heap can reduce its stability either as a result of the mine entry collapsing or otherwise by introducing mine water into the spoil heap. Three disused shafts and one disused adit are present close to the south boundary of the Site, Taskers Pit, Glyndyrus Shaft, an un-named shaft and the Glyndyrus Level (ironstone) (see *Extract from Ordnance Survey (1874 Edition), drawing no. BC/MB/10.15.04.05*). The three shafts are too remote from the base of the spoil heap for a collapse of any of the shafts to affect the stability of the spoil heap. The Glyndyrus Shaft is the outflow point for the drainage system that serves the extensive mining operations northwards towards the town of Merthyr Tydfil. The outflow is continuous and is at a significant rate but is in an engineered channel and poses no risk to the stability of the spoil heap. The Glyndyrus ironstone level is situated at the toe of the south slope of the Site and was driven southwards so that any collapse of the adit where it is at shallow depths would be beyond the toe of the south slope of the spoil heap. The Glyndyrus Drift is too distant from the Site to affect its stability.

The disused adit of the Lucy No. 2 Drift underlies the spoil heap near its northern edge and beyond the Site. A collapse of the drift or instability resulting from mine water flowing out

/Cont....

of the drift could affect the stability of the east facing slope of the spoil heap near its northern extremity, near Pitwood House; it would tend not to affect the stability of the south facing slope at the margins of the Site. There is presently no evidence of seepage from the area of the Lucy No. 2 Drift.

6 Stability of Site: Discussion and Recommendations

The Park Home has no permanent foundation and so is much less susceptible to structural damage from limited ground movements than is a conventionally constructed dwelling. The location for the Park Home at Glyndyrus Close, the Site, is on the levelled surface of a disused colliery spoil heap. A walkover survey of the Site found no evidence of instability in the spoil heap and no evidence of surface water entering the spoil heap or of seepages from the spoil heap. The main, front slope of the spoil heap is at a relatively low slope angle that is shallower than the angle of repose for colliery spoil, resulting in an acceptable factor of safety. An assessment of the mining history of the area has identified that there is no risk of shallow mine workings collapsing up to the base of the spoil heap and no risk of a disused mine entry collapsing where it could affect the stability of the spoil heap. There is no active mining in the locality that might affect the stability of the spoil heap.

The age of the spoil heap has not been determined precisely but records suggest that it was substantially in place in 1919. The age of the spoil heap suggests that it is intrinsically stable.

The Site and the spoil heap are not in an area at risk of flooding from rivers whereby a flood event could reduce the stability of the spoil heap. The Site is not on a major aquifer or spring line whereby groundwater flows might affect the stability of the spoil heap.

The spoil heap, and therefore the Site, is considered to be stable and is at no significant risk of failure that might adversely affect a structure such as the proposed Park Home with its semi-mobile foundation construction.

/Cont....

The Park Home will surcharge the top of the southern face of the spoil heap. To avoid inducing a localised, shallow slip in the southern face it would be prudent to locate the Park Home a short distance back from the top of the slope. A detailed slope analysis is out of keeping with the very small scale of the proposed development and the low loadings that will result from the Park Home. The Park Home should be located no closer than 10m from the top of the slope.



**Dr Malcolm Blandford,
Chartered Geologist.**

Report Date 17th November 2015.

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PLANS

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Geologists Working With The Environment...

General Location Plan.

Plan Scale: 1:50,000.

Key to Symbols:

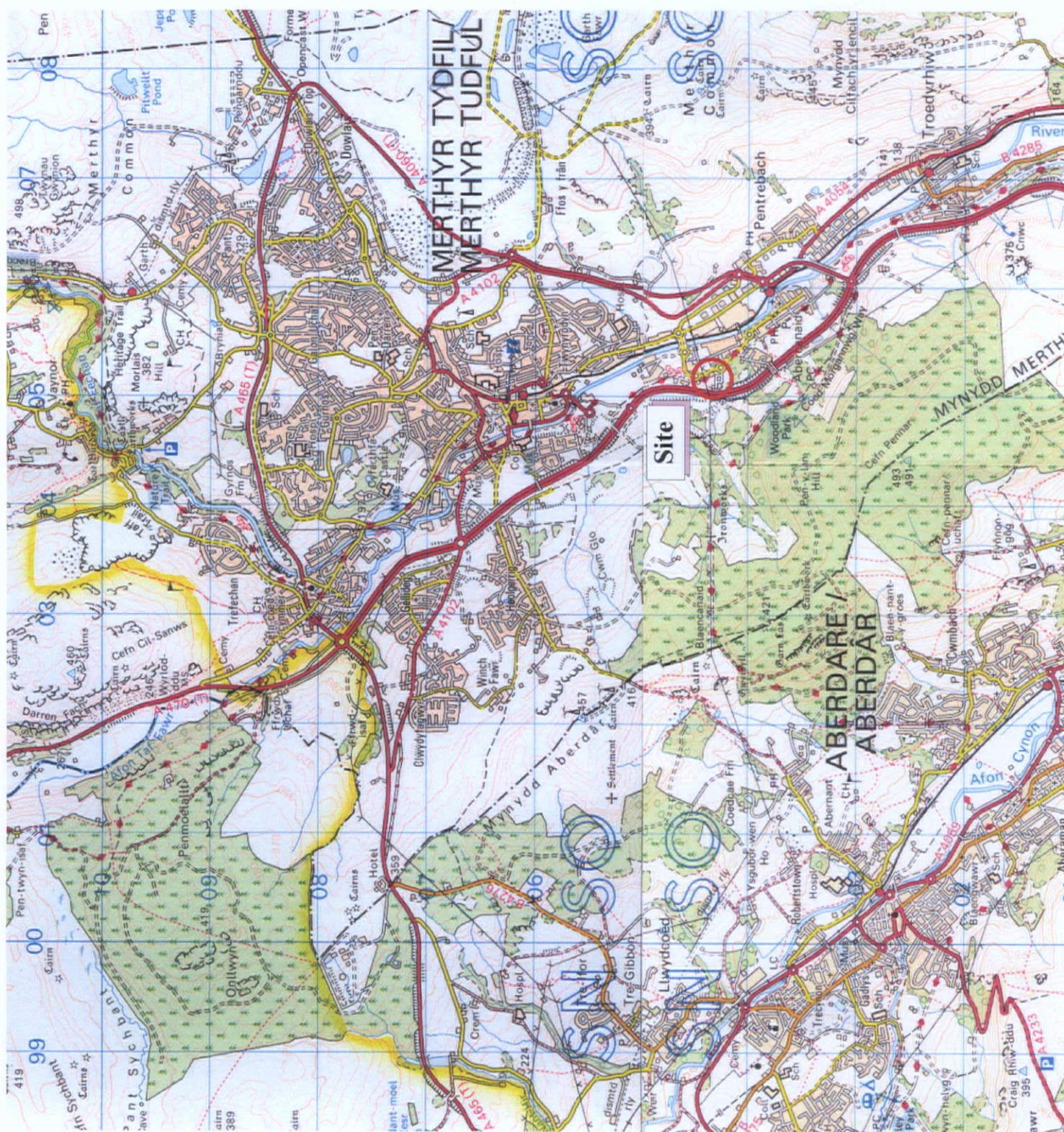


Approximate Position of Site.

Note:

North is at top of plan.

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Geology Plan.

Plan Scale: 1:10,560.

Key to Symbols:

— Approximate Site Boundary.

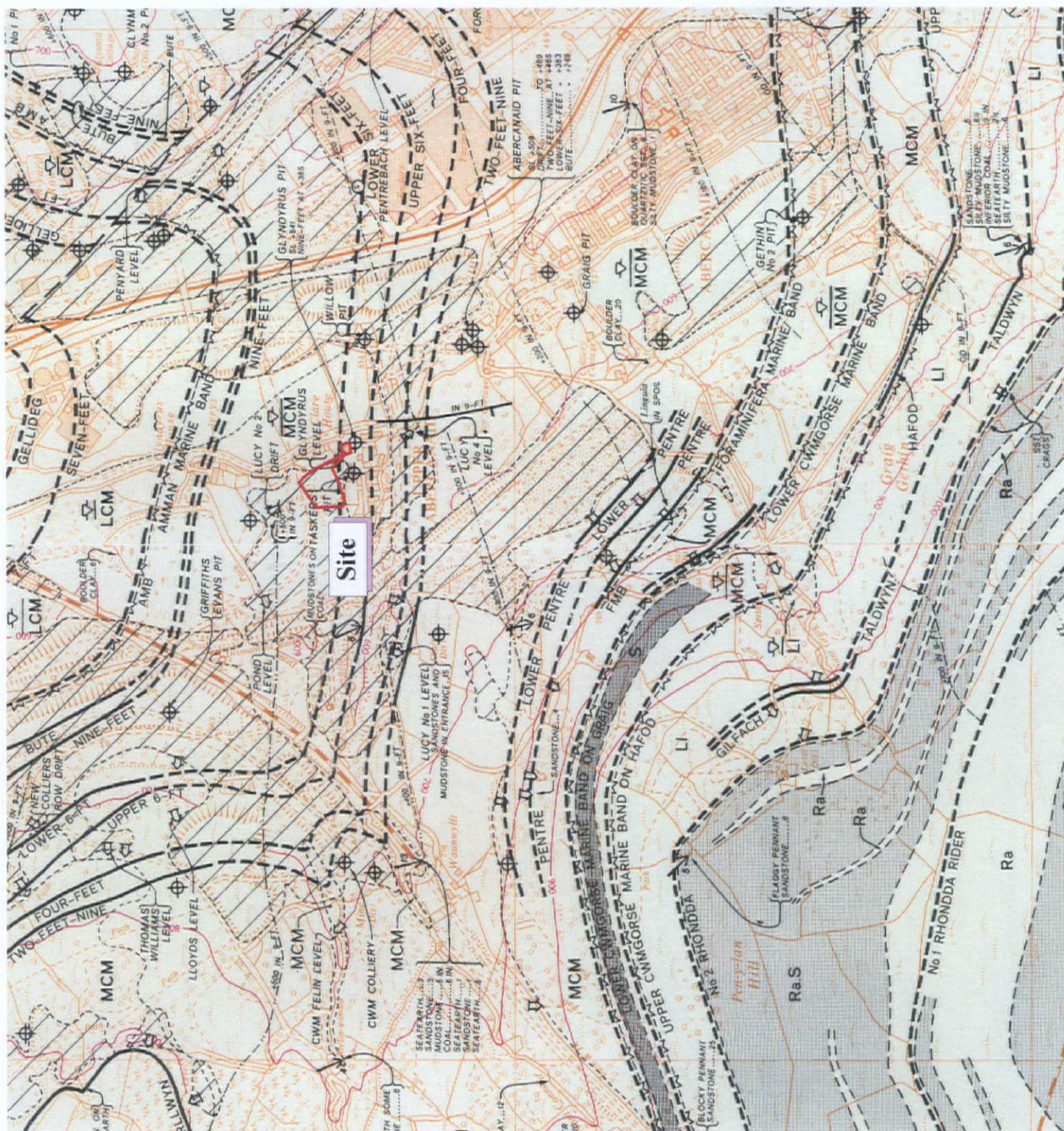
Note: North is at top of plan.

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Drawing No: BC/MB/10.15.04.02.



Study on Land at Glyndyrus Close, Abercarnaid.

Groundwater Vulnerability Plan.

Plan Scale: 1:100,000.

Key to Symbols:



Approximate Position of Site.

- Major Aquifer.

- Minor Aquifer.

Non-Aquifer.

Note:

North is at top of plan.

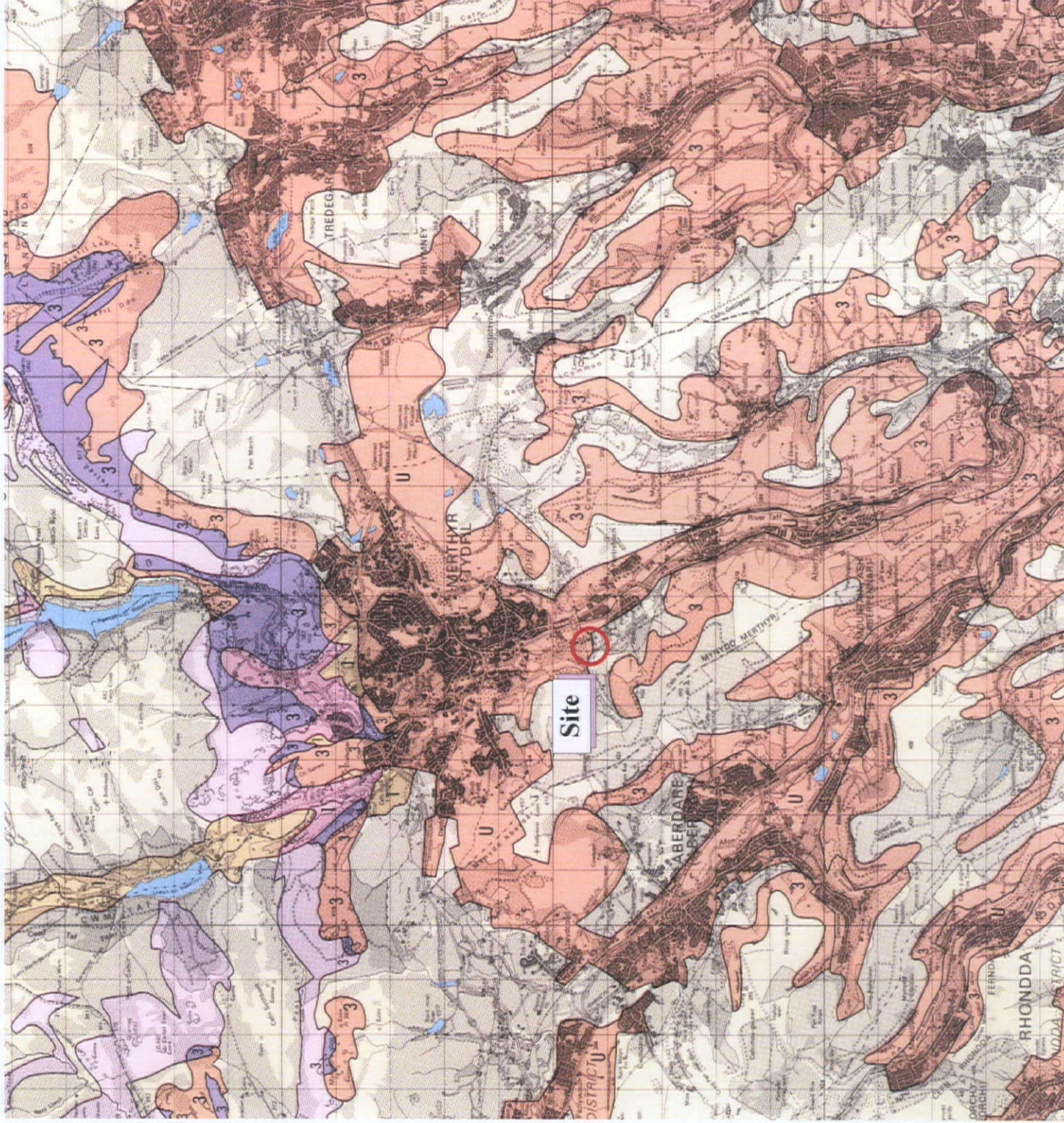
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Drawing No: BC/MB/10.15.04.03.



Detailed Location Plan.

Plan Scale: 1:2,500.

Key to Symbols:

— Approximate Site Boundary.

Note:

North is at top of plan.

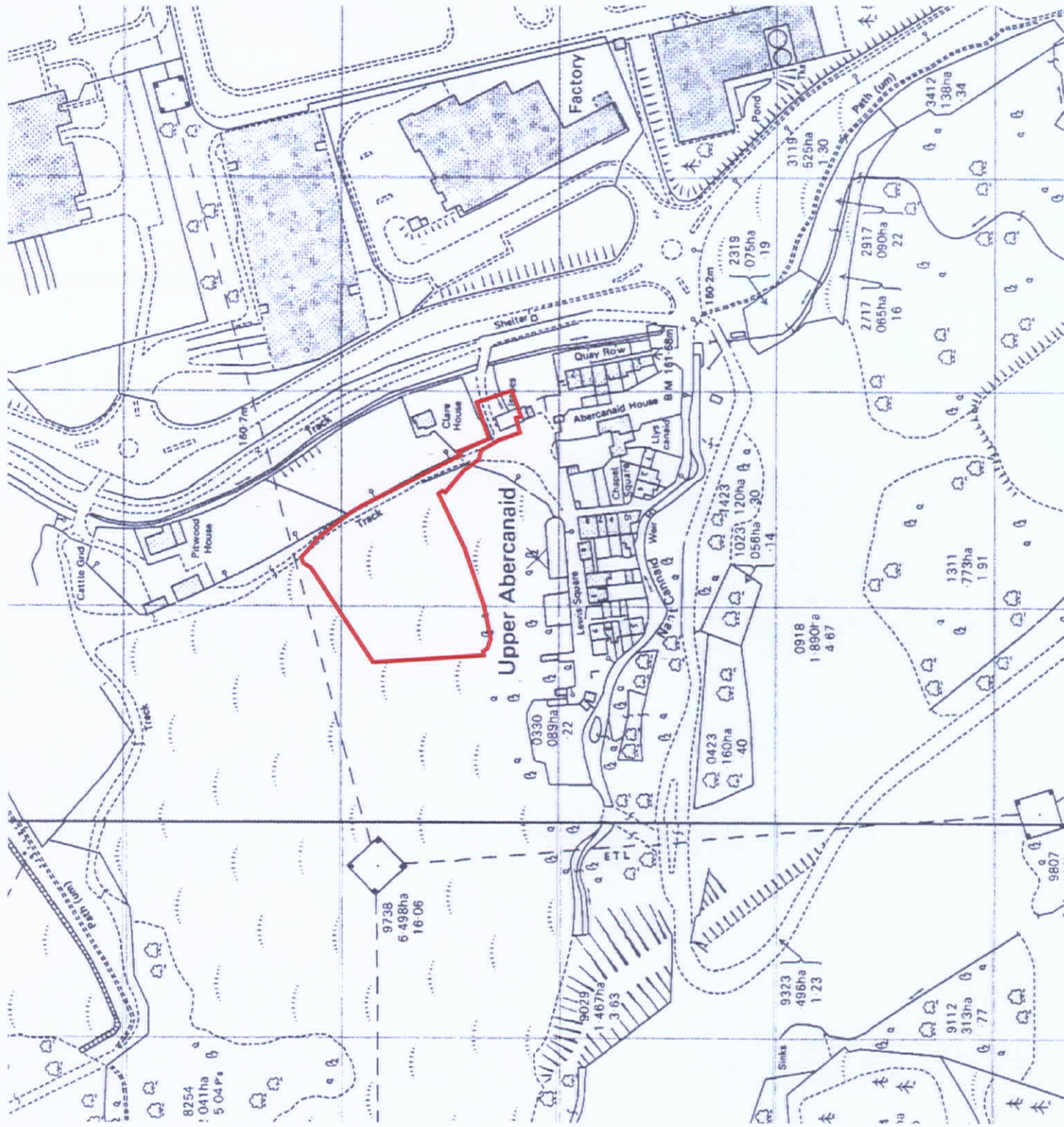
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Drawing No: BC/MB/10.15.04.04.



Extract from Ordnance Survey (1875 Edition).

Plan Scale: 1:1,250

Key to Symbols:

Approximate Site Boundary.

Approximate Position of Disused Shaft.

Approximate Position of Disused Adit.

Note:

North is at top of plan.

Locations are approximate and should not be scaled.

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Drawing No: BC/MB/10.15.04.05.



**Glyndyrus
Drift**

Extract from Ordnance Survey (1919 Edition).

Plan Scale: 1:2,500.

Key to Symbols:

Approximate Site Boundary.

Note:

North is at top of plan.

Locations are approximate and should not be scaled.

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