RHONDDA GEOTECHNICAL SERVICES

GEOTECHNICAL HISTORY

OF

PARC EIRIN/ WILFRIED WAY

TONYREFAIL

WITH REFERENCE TO SITE REMODELLING

AND PREVIOUS LOSS OF ECOLOGICAL HABITATS

14/12/2023

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INTRODUCTION

Jordan Civil Engineering have bought a parcel of Land at Parc Eirin, Tonyrefail. The land is earmarked for industrial development and the vendor was the Welsh Assembly Government. Jordan Civils intend building industrial units on the land. As part of the pre-application process an ecological survey is required to be carried out. This is to be carried out by specialists. The site is currently a barren clay plateau stripped of previous grassy vegetation. This has been done to facilitate geotechnical testing, contaminated land testing and porosity testing for SuDS. It is the purpose of this report to describe the history of the site, particularly the 1999 redevelopment and its effect on current ground conditions. These have a very large bearing on the current and past ecological value of the site. This is intended to provide supplementary information to any ecological specialist unfamiliar with the site or its past development.

SITE HISTORY-ORDNANCE SURVEY

Figure 1 overleaf is the 1875 1:2500 Ordnance Survey map of the site (outlined in magenta). The site is bisected by a railway cutting. This was the Hendreforgan Branch of the Great Western Railway. The line had opened in 1857 connecting the coal mines of Gilfach Goch to Cardiff. Several small coal mines can be seen south of the site. Figure 2 is the 1885 1:10,560 and shows the site in its broader contextual setting. The site sits within a very large undeveloped area. This has the O.S. symbol for rough pasture. What is not apparent from the map is that the majority of this land is peat bog, both in the valley of the Nant Eirin and much higher up the hillside to the south. Going forward to Figure 3, the 1965 map shows very little change in the intervening 80 years. Moving on to 1999 (Figure 4) the style of the O.S. mapping has changed but the site and a large area to the west and south are still shown as rough pasture. This map was produced very shortly before the redevelopment of the site and its immediate surroundings. In Figure 4, new infrastructure in the form of the A4093 has been constructed east of the site. A roundabout specifically built to allow access to what would become Parc Eirin and Wilfried Way has been constructed. This was done under the control of the former Welsh Development Agency (see the following section for the site development history). Figure 5 is a 2023 1:10,000 revision. For some reason the residential development by Morganstone is not shown, but the completed and imminent (at the time of writing) residential phases have been outlined by the author.

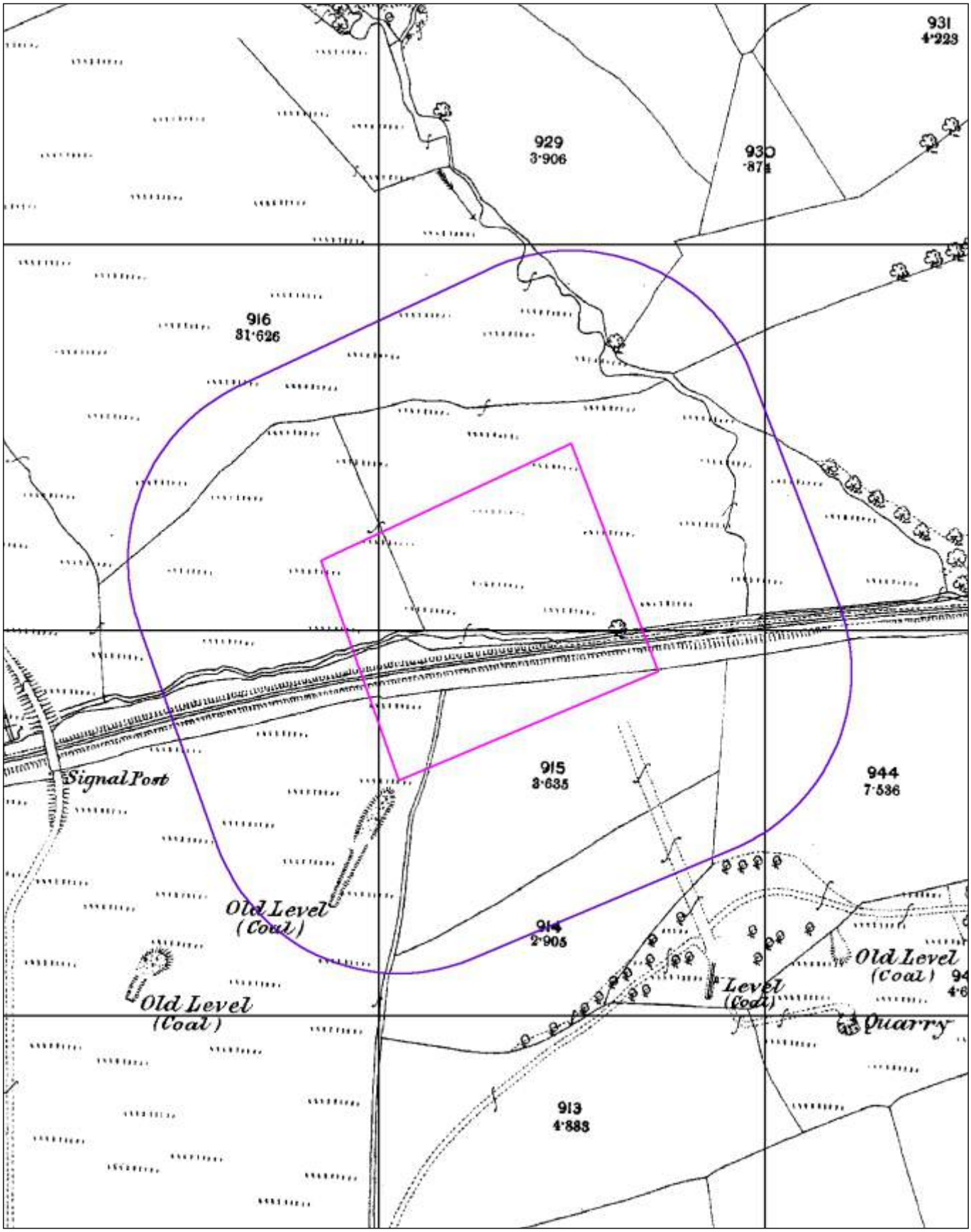


FIGURE 1

LARGE SCALE (1:2500) MAP OF THE SITE IN 1875

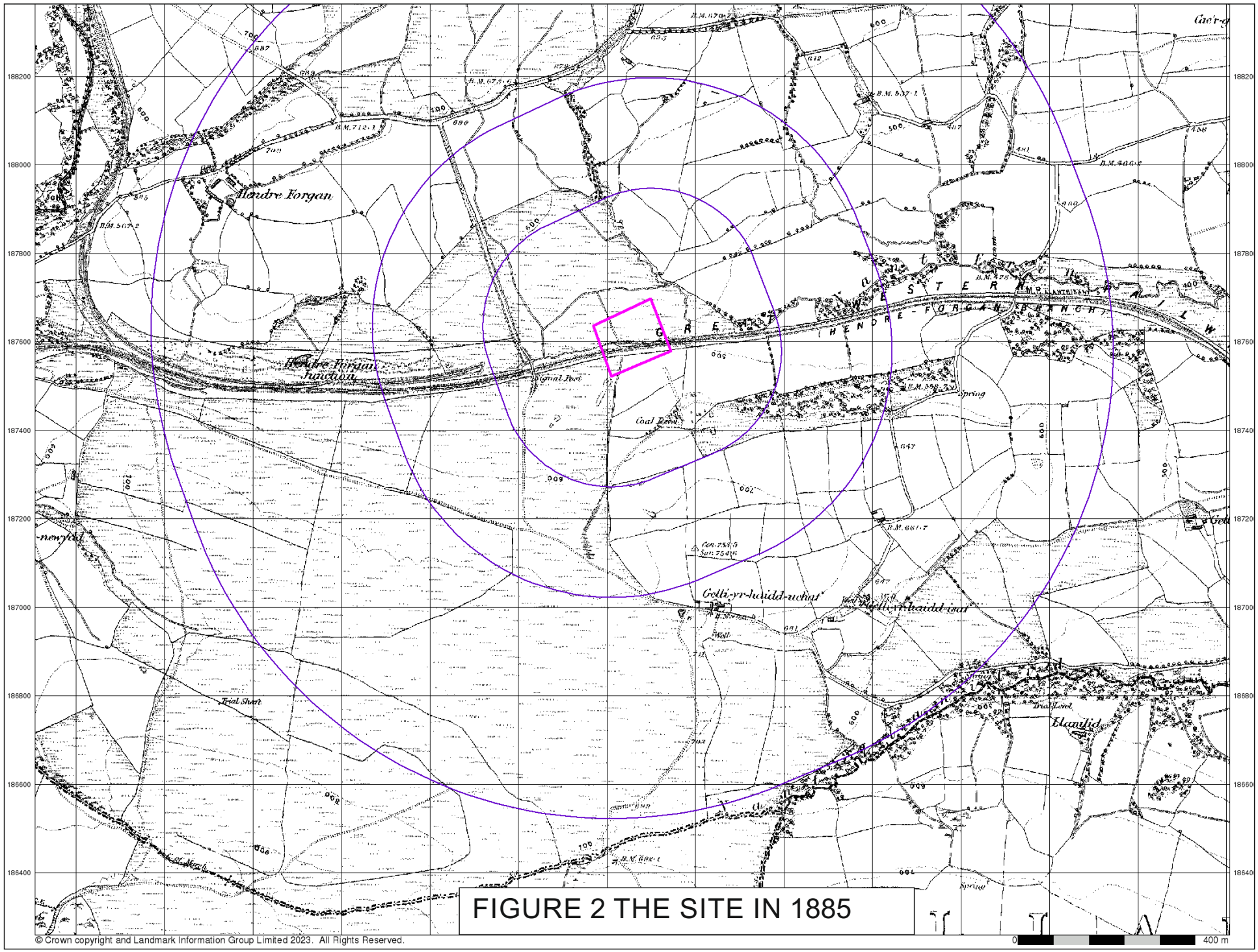


FIGURE 2 THE SITE IN 1885

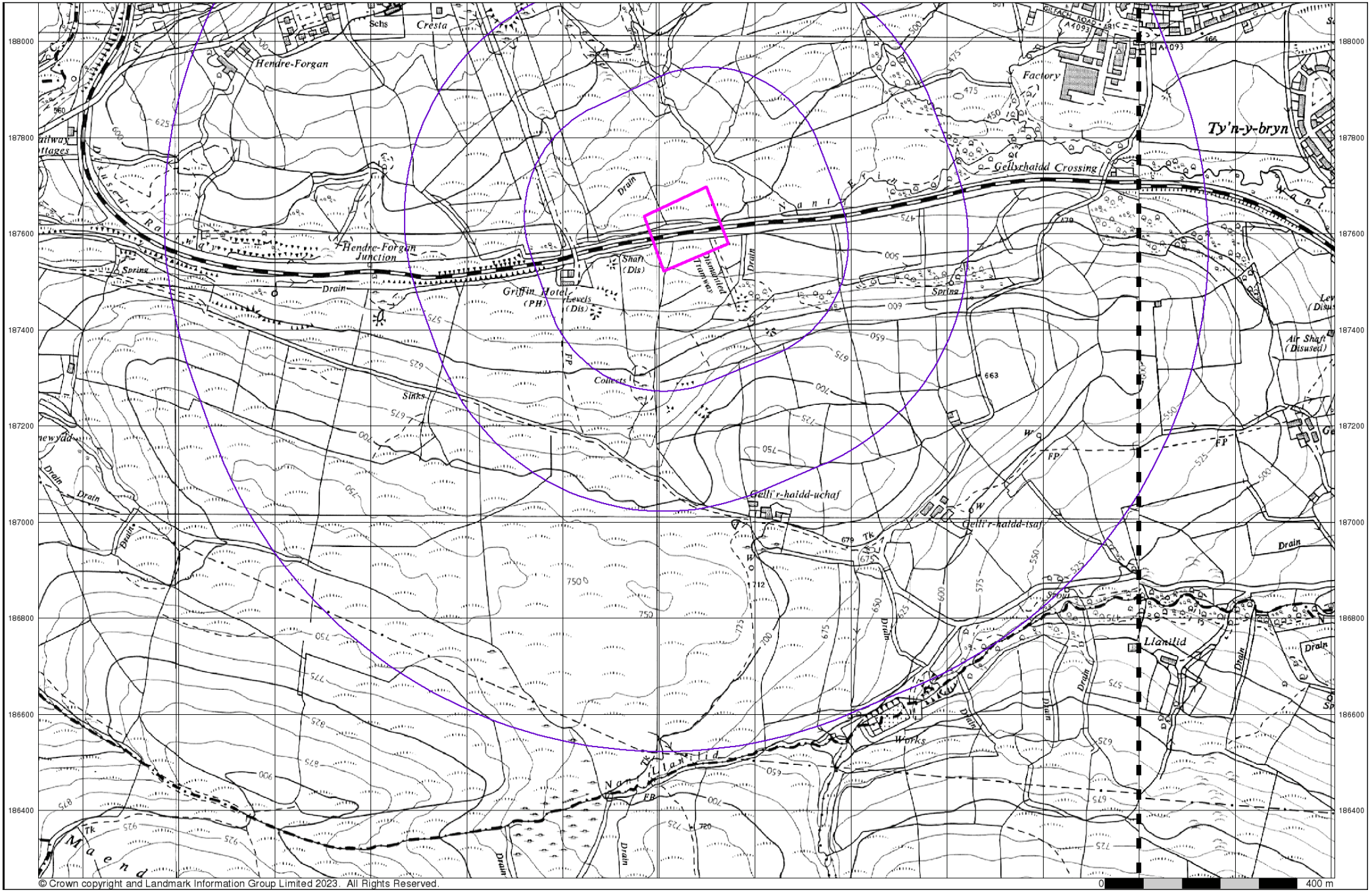


FIGURE 3 THE SITE IN 1965

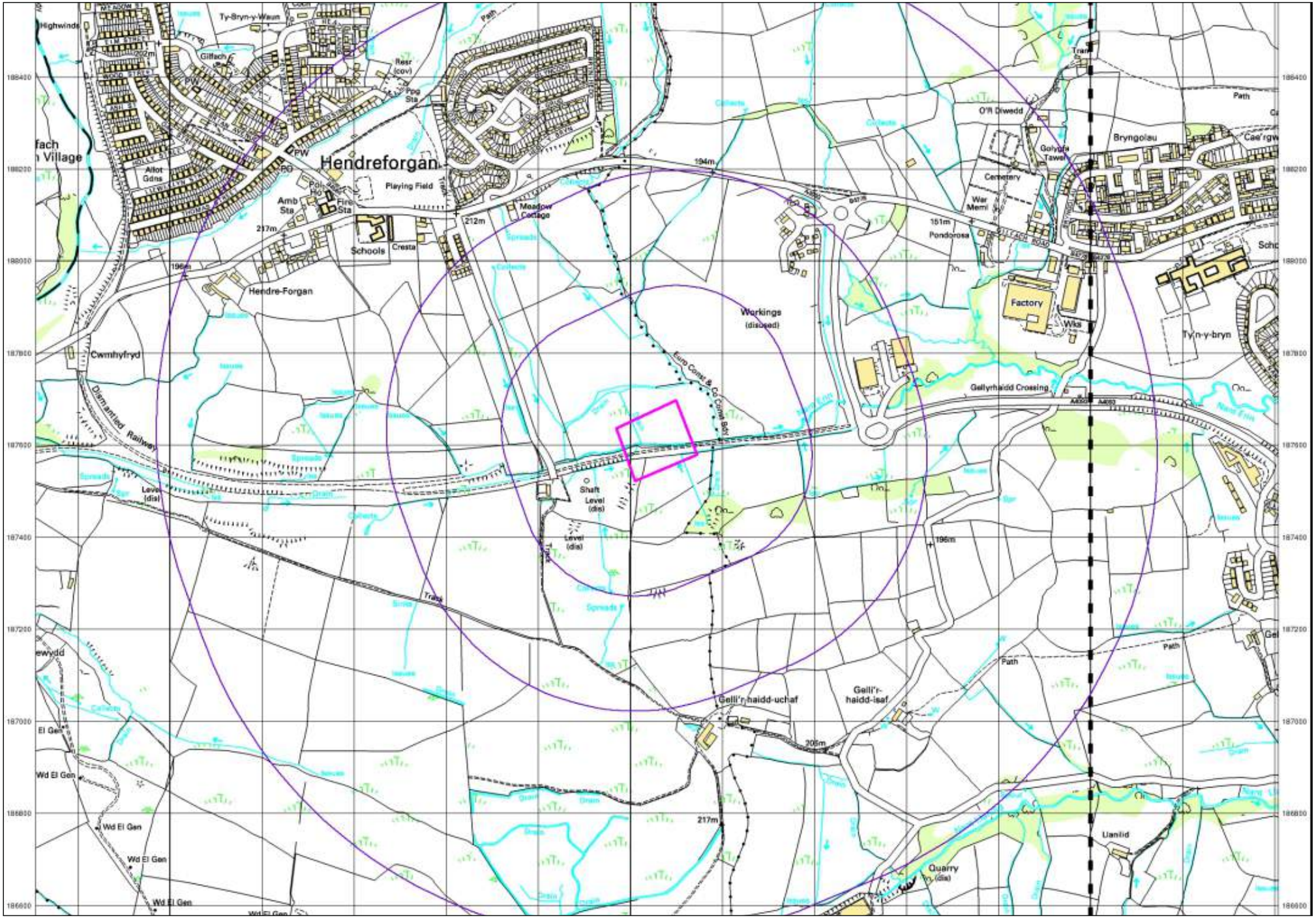


FIGURE 4 THE SITE IN 1999

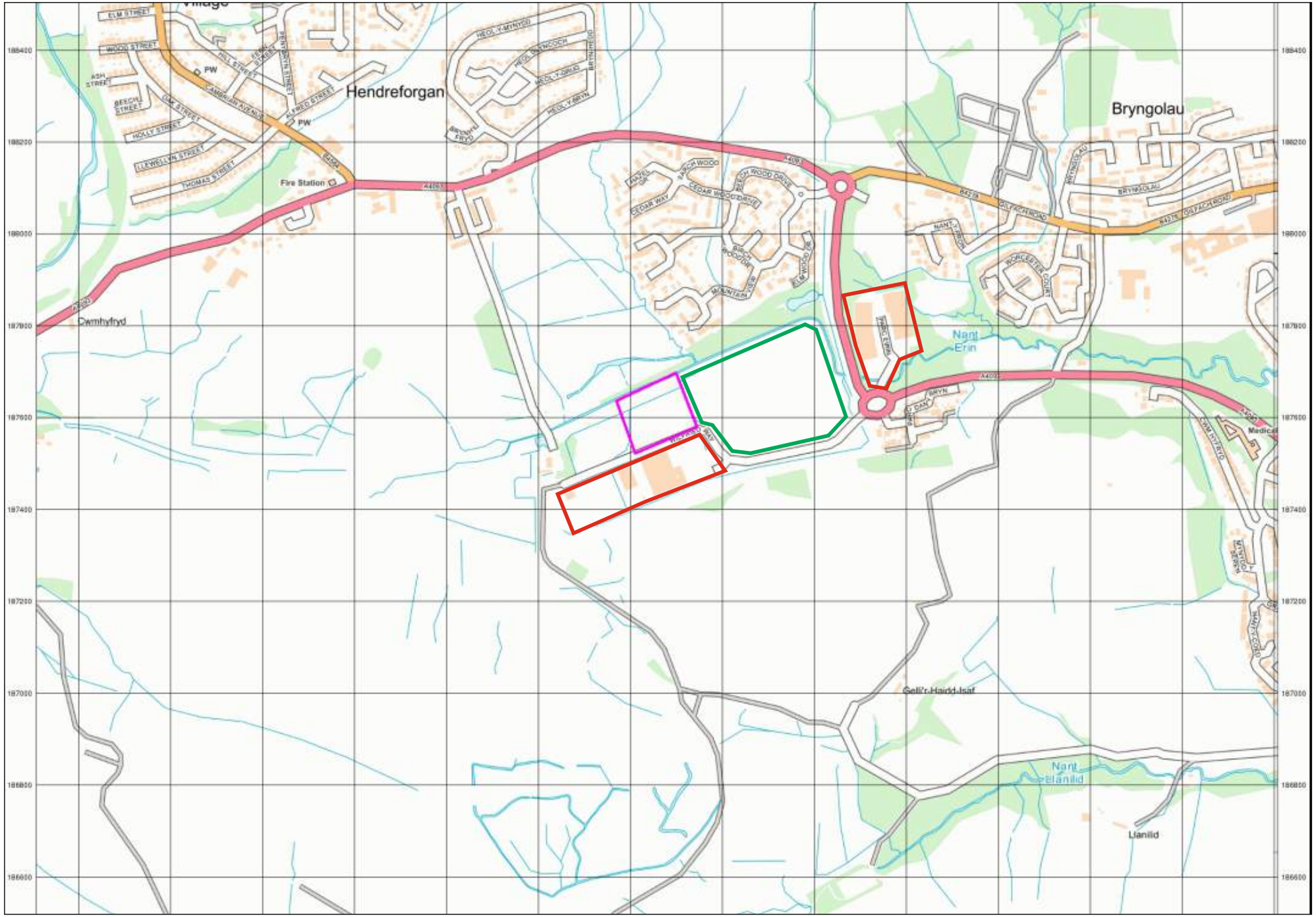


FIGURE 5 THE SITE IN 2023 THE GREEN BOUNDARY MARKS COMPLETED AND IMMINENT HOUSING. THE RED BOUNDARIES MARK COMPLETED INDUSTRIAL DEVELOPMENT

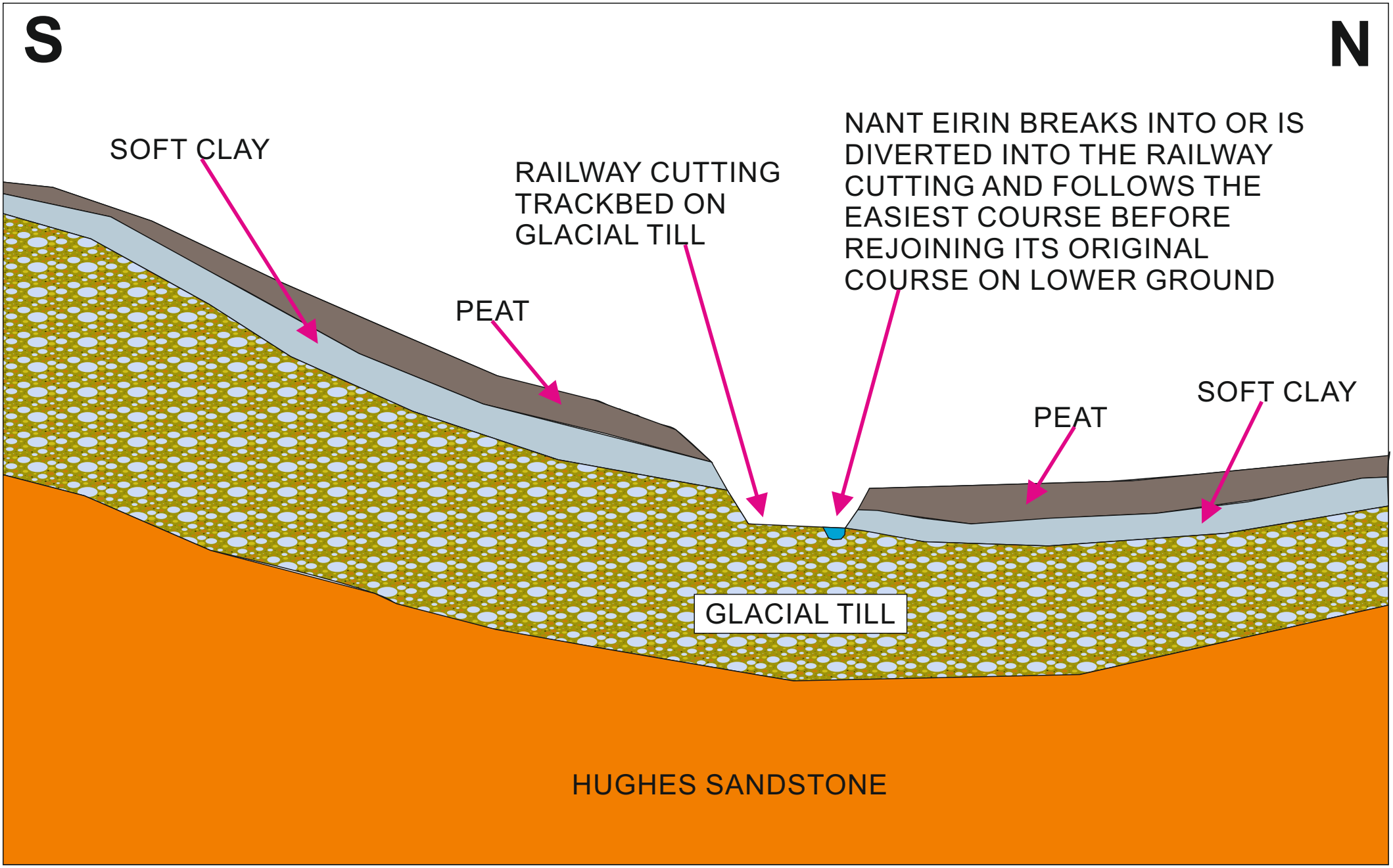
DEVELOPMENT HISTORY

The following section is based on the personal recollections of the author who lives very close to the site. The author was involved in the site development from the outset in 1999 in the capacity of a drilling contractor working for a large site investigation company.

Initial reconnaissance drilling was carried out in 1999. Temporary roadways were made into what at the time was a large expanse of marshland. The boreholes recorded 1m-1.5m of peat overlying 0.8m-1.5m of soft clay. This in turn sat on stiff Diamicton (formerly known as Boulder Clay or Glacial Till). The Diamicton dates from the Devensian Glaciation. This ended approximately 11,000 years ago with a gradually warming climate. Deep weathering of the Diamicton produced the soft clay that formerly underlaid the peat. The peat had also developed since that time. Ideal conditions for water retention were provided by the thick peat underlain relatively impermeable clay. The peat formerly extended well up the north-facing hillside south of the site. The hillside was largely drained with E.U. grants in the early 1990s.

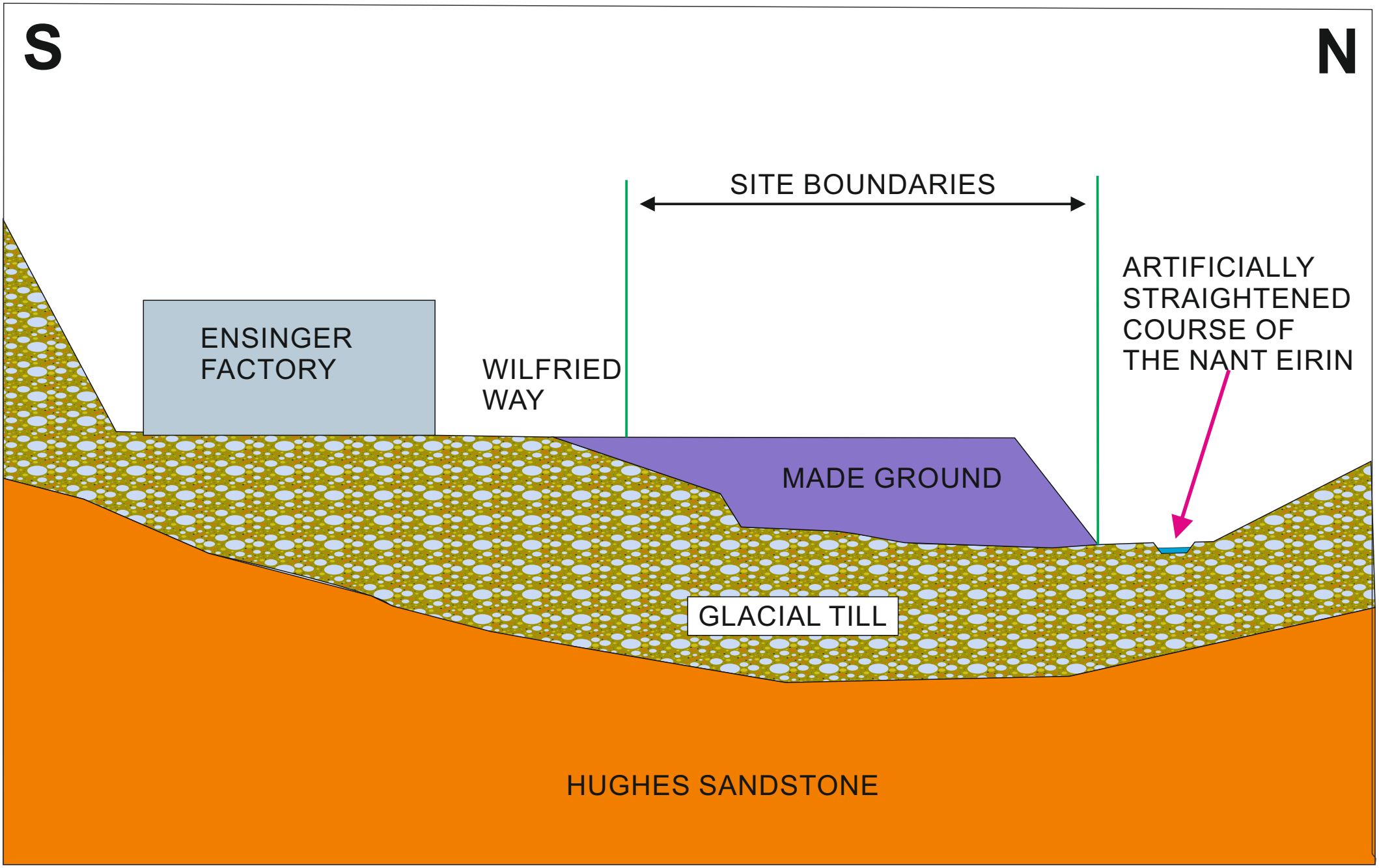
Following on from the initial site investigation, the transformation of the area began. The main contractors were Brunswick Construction, under the direction of the Welsh Development Agency. The W.D.A. had many similar projects in the former South Wales Coalfield with the objective of diversifying the economy. Part of this strategy was building units suitable for occupation by light industry.

The peat was stripped off and removed from site, presumably for sale for re-use. The soft clay was then also removed, but in the case of the clay it was dumped in a large borrow pit situated on Gelli'r Haidd Uchaf Farm above the site. Large quantities of sandstone had been quarried and stockpiled at that location for road sub-base. The softer, inferior clay was tipped in the new quarry. The objective of the work was to create a large flat area for industrial development. To this end a large cut and fill was developed. The former slope to the south of the area (behind the Ensinger factory) was reduced and the surplus Diamicton pushed northward. Here it was compacted, filling the former railway cutting and diverting the Nant Eirin into an artificially straightened channel. The newly created plateau was covered with a nominal 300mm-500mm of substrate as a temporary landscaping move. The remodelled Diamicton was then left to further self-consolidate for a period of several years. During this time occasional return visits were made by the author with the purpose of drilling boreholes to carry out geotechnical testing of the consolidation rates. Cross sections of the site before and after redevelopment are presented overleaf as Sections A and B.



SECTION A

SOUTH-NORTH CROSS SECTION OF THE SITE PRIOR TO THE W.D.A. REDEVELOPMENT



SECTION B

SOUTH-NORTH CROSS SECTION OF THE SITE AFTER TO THE W.D.A. REDEVELOPMENT

SITE VISIT

A walkover survey was conducted on 25/11/2023. The object of this was to compare the site (meaning specifically the land subject to the planning application) and the surrounding area with undeveloped land nearby that is still in its original condition. The land behind the Griffin Inn was formerly proposed as part of the original W.D.A. development. This would have meant the demolition of the pub. Legal issues meant that the Griffin Inn and the private access road could not be compulsorily purchased by the W.D.A. and the Landlady did not wish to sell. The W.D.A. then curtailed the full expansion. The land behind the Griffin is identical to the former condition of the land redeveloped by the W.D.A. There have been subsequent efforts to redevelop this parcel with a road constructed just south of the Public House. The ownership and future of the land is currently unknown to the author and the land remains in pristine condition for the moment. The author carried out drilling on the undeveloped land in approximately 2005. The makeup of the ground beneath was identical with the Peat/Soft Clay/Diamicton sequence originally present on the main site.

Figure 6 shows a view of the peat bog from the former haul road. Figure 7 shows a close-up view of the vegetation. Figure 8 shows a view up the haul road to the borrow pit used during the redevelopment. Figure 9 shows a view of the plateau area from the hillside above. The site subject to the planning application is highlighted. Figure 10 shows the site at present-a featureless artificial plateau. As would be expected there had previously been some plant cover on the site. This had developed in the 23 years the site has effectively been lying fallow. The roots of the vegetation cover were limited to the top substrate covering the site. As previously mentioned, this was 300mm-500mm thick. This top layer was much more granular than the underlying Diamicton and contained a variable proportion of organic material. The provenance of this material is unknown. It contains a high proportion of angular brick and concrete fragments and could not be described as Topsoil under BS3882. It is reasonable to assume it was stripped from elsewhere and imported to site. It certainly did not originate within the site boundaries, nor is it a natural soil. Despite its deficiencies as a true soil, it did support some vegetation. The vegetation that had developed consisted of rough grass with scattered scrubby bushes. This is the cover described as marshy grassland by an earlier ecology report. It is the author's assumption that the ecology survey was done during, or after a prolonged period of wet weather. The description marshy would imply a soft, permanently wet landscape. This is not the case. The underlying material is very compact. Geotechnical testing has produced a bearing capacity of 150kN/m^2. The compacted Diamicton is also completely impermeable. BRE365 permeability testing on the site produced a value of 3.62 x 10^{-8}m/s. For anyone unfamiliar with relative permeability values, this material would be considered impermeable enough to line a hazardous waste landfill. This means the site had no

potential to be a true wetland. During warm or windy weather, the ground would dry out completely due to the shallow granular nature of the top substrate. A more appropriate description of the site at the time of the survey would be waterlogged grassland and scrub. No soil or vegetation has been removed from site and everything that was previously growing on the surface is now in the bunds seen in Figure 10. This can be compared with the adjacent plot seen in Figure 11. This has an identical history and underlying soil conditions to the application site. The only difference is that the site has been managed. It is regularly mown by contractors with a tractor. It is not known who is paying for this, or why this is being done.

Both sites can be contrasted with the undisturbed peat bog to the west of the site. The water retention capacity of Peat is huge. The thickness of the accumulated peat and its location in a natural valley bottom mean it could never dry out, and can be considered a true permanent wetland.

CONCLUSIONS

The site is a totally artificial construct with little visible ecological value. The site was previously within a large peat bog that had developed over the course of 10,000 years. However, all the peat was removed, and the ground level raised by up to 3m. This might well be considered an act of ecological vandalism today, but the applicants cannot be held responsible for previous government policy. To return any of the site to its previous condition is physically impossible. It is hoped that with proposed drainage arrangements necessary for S.A.B. approval that a degree of biodiversity can be achieved in harmony with the proposed development. This could probably be achieved by planned planting combined with soil importation in and around water features. This approach is currently encouraged in SuDS approved schemes but is beyond the remit of this report.

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14.12.2023

FIGURE 6
UNDISTURBED PEAT BOG AT THE REAR OF THE GRIFFIN INN VIEWED FROM THE HAUL ROAD

FIGURE 7

CLOSE UP VIEW OF THE VEGETATION BEHIND THE GRIFFIN INN.

FIGURE 8
HAUL ROAD LEADING TO GELLI'R HAIDD UCHAF.

FIGURE 9
VIEW OF THE PLATEAU FROM ABOVE. ENSINGER'S FACTORY IS TO THE RIGHT. THE YELLOW LINE MARKS THE BACKLINE OF THE PLATEAU. THE DEVELOPMENT PLOT IS HIGHLIGHTED ORANGE

FIGURE 10 THE SITE AT PRESENT. WATER IS HOLDING ON THE SURFACE

FIGURE 11

THE ADJACENT PLOT. THIS IS MAINTAINED BY LANDSCAPE CONTRACTORS BUT THERE IS NO PHYSICAL DIFFERENCE FROM THE DEVELOPMENT PLOT BELOW GROUND LEVEL