



RHONDDA
GEOTECHNICAL
SERVICES

PHASE 1 AND 2
CONTAMINATED LAND ASSESSMENT

N.P.T. PLANNING APP. 19/0971/10

LAND ADJACENT TO

22 KNOLL ROAD

GODRERGRAIG

SWANSEA

SA9 2DE

28/9/2020

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INTRODUCTION-PURPOSES AND AIMS

Neath Port Talbot L.P.A. have granted full planning for four detached residential properties on a vacant plot adjacent to 22 Knoll Road, Godrergraig, in the Swansea Valley. The application number is P/2014/0495. In Condition 9 of the granted application N.P.T. have stated that no development shall commence until a scheme to assess the nature and extent of any contamination on the site has been submitted and approved by the L.P.A. Rhondda Geotechnical Services have been engaged to carry out this work.

The report will take the form of:-

i) A desk top study to identify all previous uses of the site and potential contaminants associated with those uses. This should include a Conceptual Site Model (C.S.M.). The desk study is known as a Phase 1 Contaminated Land Report.

ii) A survey of the extent, scale and nature of contamination

iii) An assessment of the potential risks to:-

Human health, controlled waters, adjoining land and properties, ecological systems and archaeological sites.

iv) An appraisal of remedial options, (*if these are necessary- author*), and a proposal of the preferred option. Points ii-iv are known as a Phase 2 Report.

The report will follow the guidelines set out in the document Development of Land Affected by Contamination: A Guide for Developers (Version 3). This was produced by the Welsh Land Contamination Working Group in 2017. In particular the methodology set out in appendix B with the check list for Phase 1 and 2 will be followed. The contaminated land exposure assessment (henceforth CLEA) produced by The Environment Agency will be used in the conceptual model, particularly in regard to the source-pathway-receptor concept for pollutant linkages. The entire project will be guided by the 2004 Defra/E.A. document CLR11 (Model Procedures for the Management of Land Contamination).

The current definition of contaminated land is “any land which appears to the local authority in whose area it is situated in to be in such a condition, by reason of substances in or under the ground that:-

- a. Significant harm is being caused, or there is a significant possibility of such harm being caused OR
- b. Pollution of controlled waters is being, or is likely to be caused”

Section 78A Part 2A Environmental Protection Act

This act also requires that a risk based approach should be used for assessing the contamination status of a site. For a site to be designated as contaminated it must be shown that the site is not fit for its current, or intended use. Statutory guidance states that a two stage approach should be adopted for the assessment of contaminated land.

1. Identification of potential pollution linkages
2. Assessment of the risk to receptors

The first stage (The Phase 1 report) is a qualitative assessment of the plausible pollution linkages that exist or may exist on site. This involves the development of a site conceptual model. This may then be refined in Phase 2 after an intrusive investigation, followed by laboratory testing of samples obtained.

1. AUTHOR CREDENTIALS

The author of this report is Richard Davies. I graduated with a Batchelor of Science honours degree in Geology from Liverpool University in 1979. After starting my career as an engineer in the coal industry, I moved into site investigation in the 1980's and have many years experience working on contaminated land. I am a Fellow of The Geological Society and hold a Master's Degree in Applied Environmental Geology from Cardiff University. I am also a Supporter Member of CL: AIRE (Contaminated Land: Applications in Real Environments)

2. SITE DESCRIPTION

The site is centred on grid reference 275180,206715 and ranges in elevation between 64m-78m A.O.D. The site is an irregular shape, roughly triangular and covers an area of 0.25 Ha. There are no surface watercourses. The site location and site boundary can be seen overleaf in Figures 1 and 2 with an aerial photograph of the site in Figure 3.

3. SITE WALKOVER

Because the planning permission dates to 2014 the wording of the contamination conditions differ from today. Normally a Phase 1 desk study would recommend an intrusive site investigation with sampling and chemical testing only if the C.S.M. deemed it necessary. This would depend on plausible source-pathway-receptors being present on site. Since the older condition insisted on a “survey of the extent and nature of contamination” a Phase 2 was inevitable. Because of this there was no site walkover as such. Instead an excavator was taken to site on 8/09/2020 in order to carry out an intrusive investigation with trial pitting and the collection of samples for laboratory testing. After an initial inspection of the site and a review of the proposed site layout, the trial pit locations were set out across the site. These will be described in detail in the Phase 2 report which will be presented as one document following on directly from the Phase 1 report.

The site was steeply sloping with substantial retaining walls top and bottom of the site. These had apparently been built during an earlier attempt to develop the site which ended in financial failure. The site had been largely stripped of the scrubby woodland seen in Figure 3 and was covered in bare soil or weeds. There was some small scale fly-tipping of building materials, but no obvious signs of contamination.

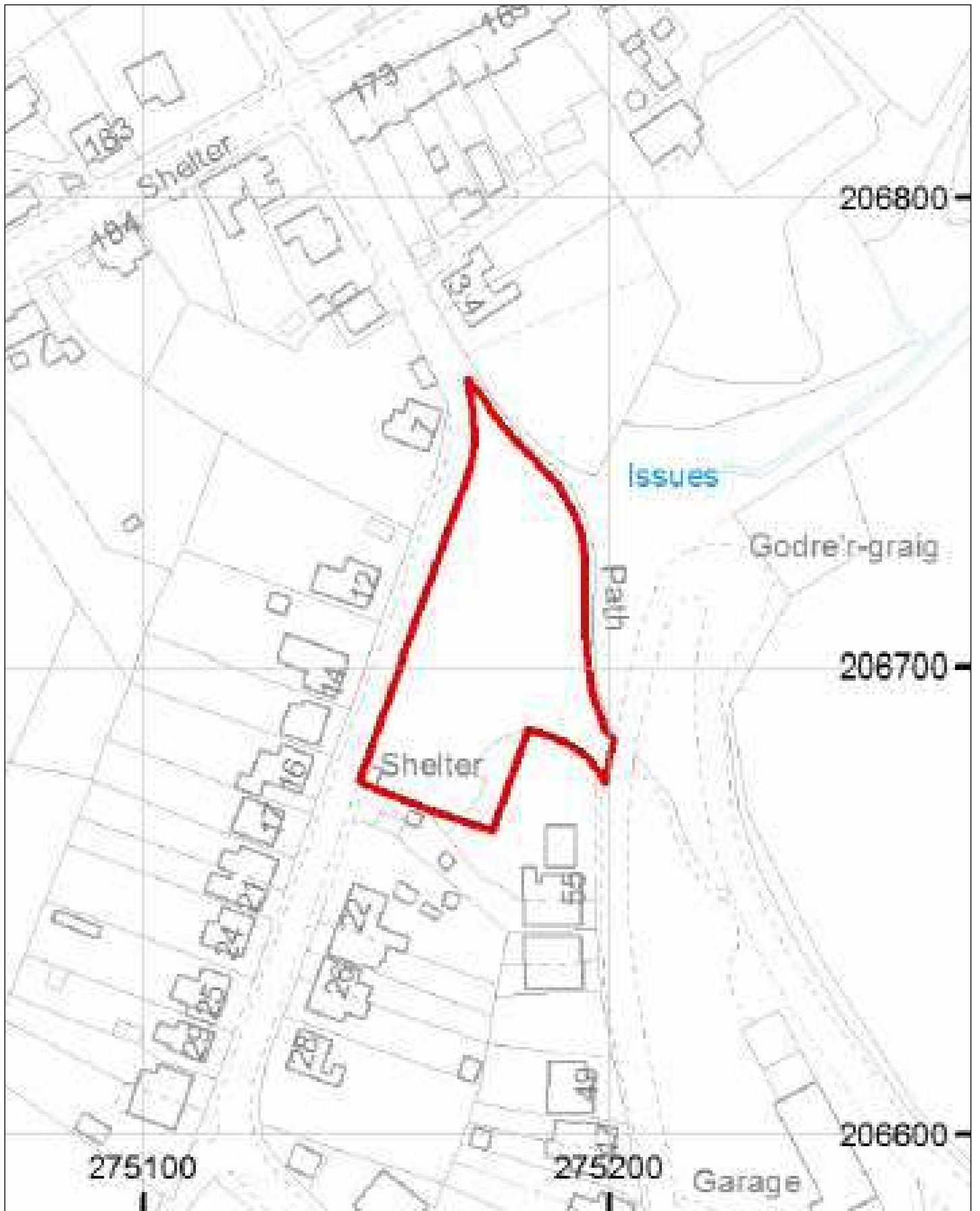


FIGURE 2
SITE BOUNDARY IN RED



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FIGURE 3
AERIAL PHOTOGRAPH OF THE SITE IN 2017

4. SITE HISTORY

In order to gain a thorough understanding of the history of the site a comprehensive collection of historical Ordnance Survey maps was purchased from Groundsure. These were at both 1:1250, 1:2500 and 1:10560 scales (later maps are at 1:10,000). Obviously, the larger scale maps are preferable for a desk study, but sometimes a large gap in dates means it is necessary to fall back on the smaller scale maps. Another reason for using the smaller scale maps is that they provide a broader contextual setting for the site. In terms of the surrounding area, there have been quite significant changes from the earliest (1877) map to the present day. The site itself has changed very little since then. Extracts from the original maps are presented overleaf as Figures 4-8. These have been slightly truncated to either east or west from the originals for reasons of page fit and file size. However, nothing of significance to the desk study is missing from the extracts.

1877 SITE-The site is completely undeveloped woodland. Knoll Road does not exist.

SURROUNDING AREA- The area around the site is partly industrialised with a complex of tramlines, a railway and a canal serving various small mines. Some are named, some are just labelled “coal level”. These are all approximately 500m- 1000m from the site. The Swansea canal has frequent locks marked on it. There is limited residential development on the present day Graig Road just north of the site. There are large areas of undeveloped woodland and farmland in the surrounding area.

1899 SITE-The site is unchanged from the 1875 map. Because the 1:2500 map is superior to the 1875 it is included as Figure 4.

SURROUNDING AREA- Most of the small coal levels are marked as “old” or “disused”. Apart from that, there is little change in the area. The pattern and extent of the residential development appears identical to the earlier map.

1919-SITE- (Figure 5) The trees have been felled but the site remains essentially unchanged with the exception of one small building. From the size this would appear to be a shed or stable.

SURROUNDING AREA- Knoll Road has been built, as have many of the properties on it at present. There is some additional residential development north of the site on Graig Road. Two large school buildings have also been built. There is a

quarry 100m north of the site and a sewage plant 250m east of the site. The most significant development is the sinking of Tarreni Colliery 500m southeast of the site. This is just off the map boundary of Figure 5 but can be seen clearly on the 1913 1:10,560 map. The colliery has multiple railway sidings and a tramway runs over these and the river to a burgeoning spoil heap clearly seen in Figure 5.

1948-SITE- There is a large jump in time in the 1:2500 maps, but the 1:10,560 map from 1948 shows no development of the site but it appears there has been excavation at the southeastern margin creating the steep slope seen today.

SURROUNDING AREA- There is very little change to the residential property but there is a huge increase in the size of the spoil heaps. Now three in number they cover virtually all the river meadows on the northwest bank of the river.

1960-SITE- (Figure 6) The site is still completely undeveloped. The steep scarp in the southeast corner is seen more clearly at the larger scale. There is a yard and small building seen adjacent to the site boundary at the toe of the scarp.

SURROUNDING AREA- The spoil heaps are huge and encroach close to the eastern margin of the site. The canal is visible but marked as disused.

1970-SITE- (Figure 7) The site is still completely undeveloped.

SURROUNDING AREA- This now appears much as it does today. The canal 120m south of the site has been infilled and appears to be some kind of road or bridleway. The biggest change is that the spoil heaps have been flattened and landscaped. Tarreni Colliery is marked as disused on the 1965 small scale map (it actually closed in 1949).

2003- SITE- (Figure 8) This is at 1:1250 and the O.S. have abandoned the characteristic slope shading from earlier maps. The site is still completely undeveloped.

SURROUNDING AREA- Because of the larger scale , little of the surrounding area can be seen. A small section of the A4067 can be seen running along the former course of the Swansea canal. On the small scale maps this is constructed sometime between the 1983 and 1990 revisions.

More recent small-scale maps (2010 and 2019) have been checked but add little of relevance to the desk study. For this reason, they have not been reproduced here. There is a series of aerial photos in the Groundsure Report which are meant to fill the gaps up to the present day. The show an increase in

trees on the site (2000). Then the site is cleared (2010 and 2013) and again becomes overgrown in the most recent photo from 2017 (Figure 3).

In summary, the history of the site itself is straightforward. There has never been any development of any kind on the site itself. From a wooded area prior to the development of Knoll Road, it is cleared but remains unused. There are signs that some gravel extraction may have taken place near the eastern margin.

The surrounding area was dominated by coal mining in the nineteenth century, but this had ceased by 1949. Some traces of this still remain on the hillsides, but most of the former spoil heaps have been reclaimed. The main transport routes were the railway and Swansea Canal running on the valley floor. Graig Road above the site to the north was the main road up the valley. That has now changed with the construction of the A4067 on the former course of the canal. The railway disappeared sometime after 1969 when the last colliery in Ystradgynlais closed.



FIGURE 4
THE SITE (OUTLINED IN BLUE) IN 1899



FIGURE 5
THE SITE IN 1918

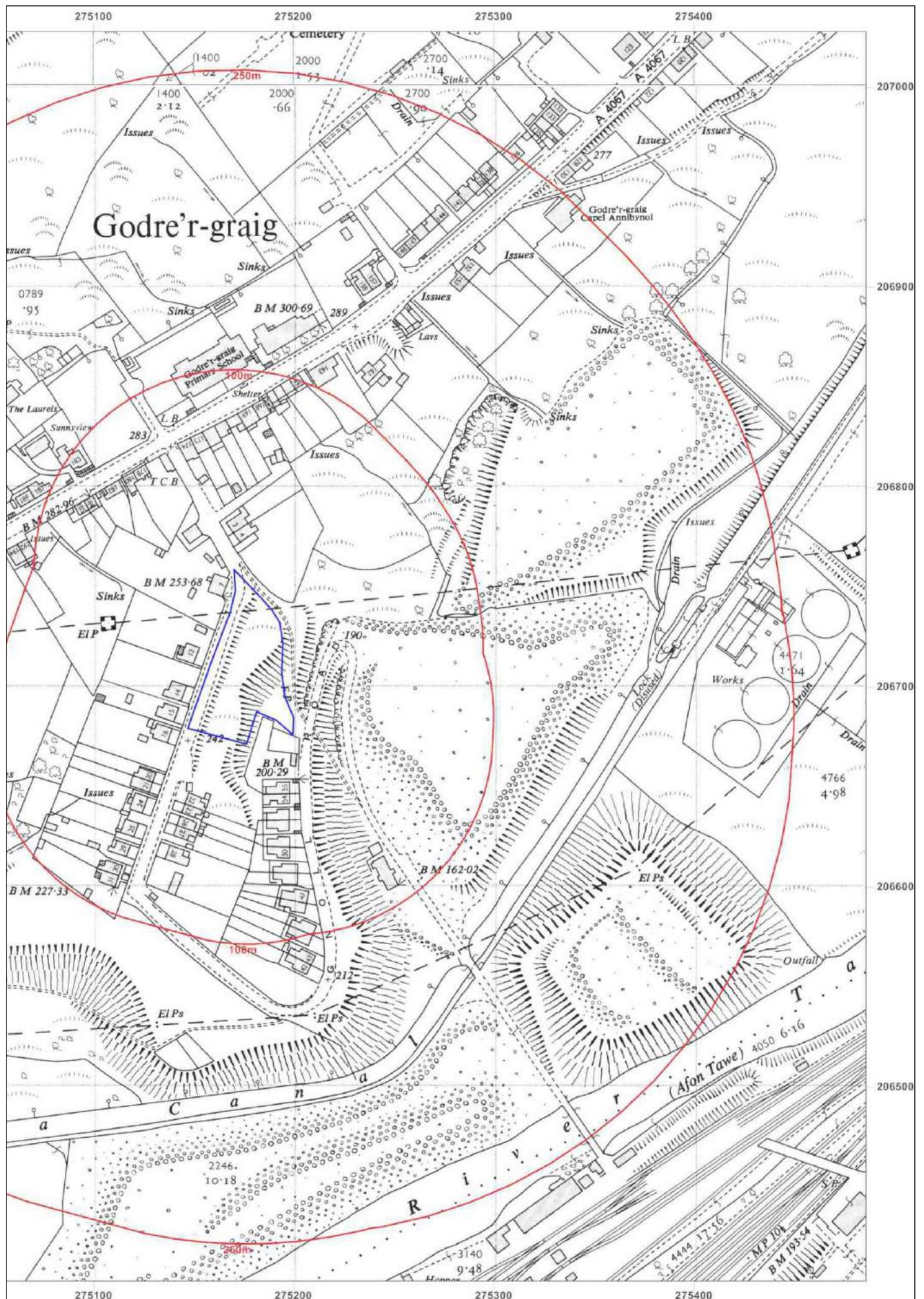


FIGURE 6
THE SITE IN 1960

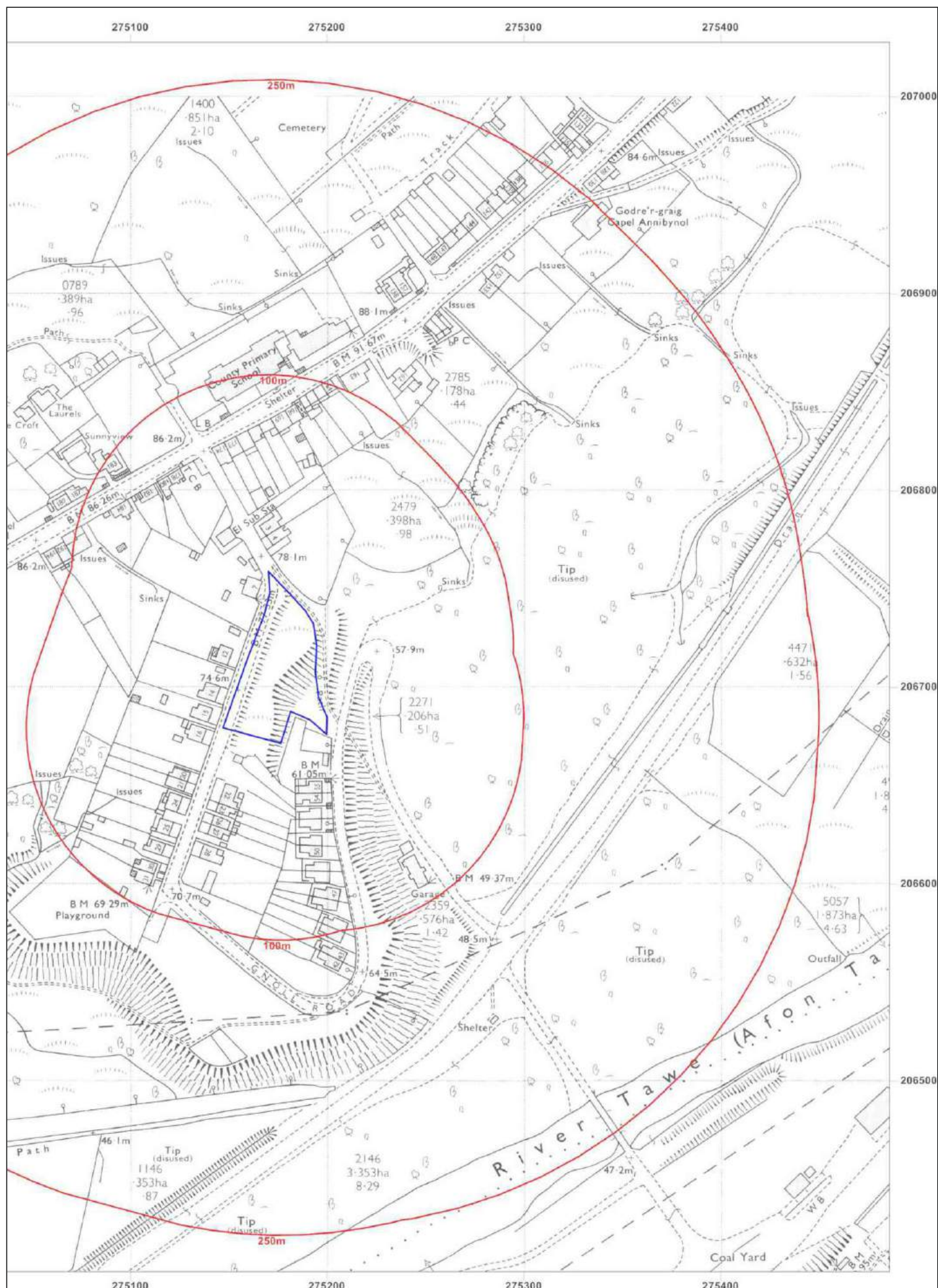


FIGURE 7
THE SITE IN 1971

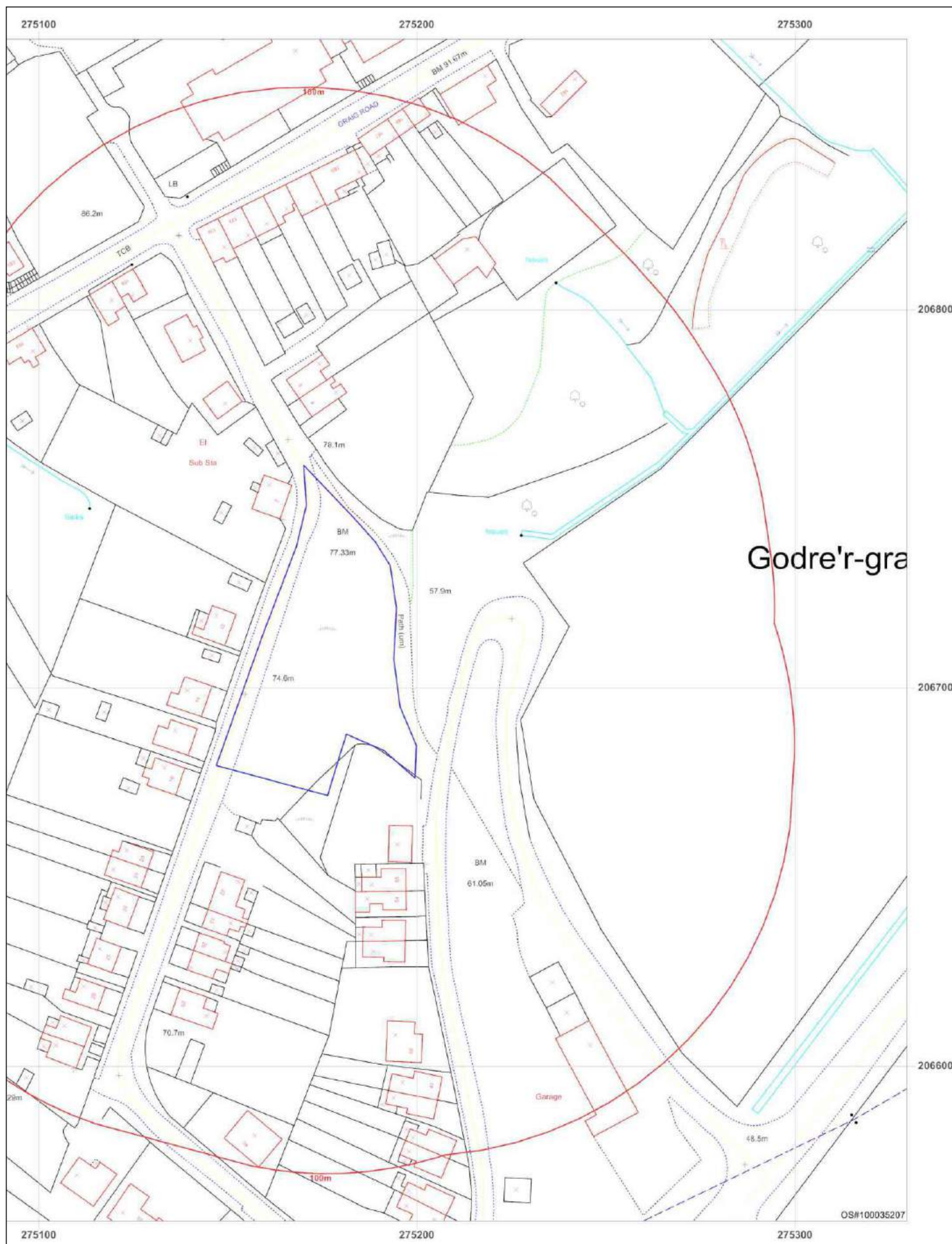


FIGURE 8
THE SITE IN 2003

5. GEOLOGY

The geology under this (or any other) site can usually be divided into two components. The bedrock and the superficial deposits (including Made Ground) overlying it. For a contaminated land study the superficial deposits are the more important of the two as they are the shallowest. This means they are the most likely to be impacted by contamination, and indeed with Made Ground, can themselves be a source of contamination. In this particular case, as described in the site walkover and site history sections, the site is not expected to have much, if any, Made Ground. On a site this small, Made Ground is unlikely to be recorded on the mapping at 1:10560, the scale of the last Geological Survey of the area.

A Geoinsight report was purchased to obtain geological information for the Phase 1. It is included in full in Appendix A. In addition, archive material from other sources held by the author has been used. This includes the Geological Survey map sheet SN 70NE.

Superficial Deposits (Natural Ground)

Figure 9 is the 1:50,000 Superficial Deposits map from the B.G.S. Geoindex. This is also the source of the map on page 81 of the Geoinsight report. The broad yellow ribbon east of the site is alluvium. This will be sand and gravel from the reworking of the glacial deposits by the River Tawe. The blue colour west of the site is Devensian Diamicton. Formerly known as boulder clay, the material is characteristically a poorly sorted mixture of gravel, cobbles and boulders with a sandy silty clay matrix. It is usually fairly impermeable although this may vary along fissures and coarser lenses. The site itself sits on an area of Devensian Glaciofluvial deposits, mainly sand and gravel. Figure 10 adds further information on the superficiales. The hillside that Knoll Road winds around is labelled as a “gravelly moraine”. A moraine is a glacial feature marking the temporary pause in the retreat of a glacier. Meltwater then deposits huge amounts of sediment forming a temporary dam across a valley. This one was evidently breached by later flow from further up the valley. Interestingly an exposure of 15’ (4.6m) of “coarse dirty gravel” is marked on the steep scarp on the eastern site boundary. This is now overgrown, but the survey was done 60 years ago, strengthening the possibility that there was gravel extraction on that part of the site.

Solid (Bedrock) Geology:-

The bedrock beneath the site is of Carboniferous Age, more specifically the Llynfi Beds of the Upper Coal Measures. Figure 10 is an extract of the six-inch Geological Survey sheet of the area (SN 70NE). The conjectural outcrop of the Lower Pinchin Seam can be seen very close to the southeast boundary of the site. The position of the site in relation to the stratigraphic succession is shown in Figure 11. The survey sheet and the Memoirs reveal that the Tarreni Colliery in the vicinity of the site was working the deeper anthracite seams for which the area was famous. There is no shallow mining in the immediate vicinity of the site and the site does not fall into a Coal Authority defined Development High Risk Area.

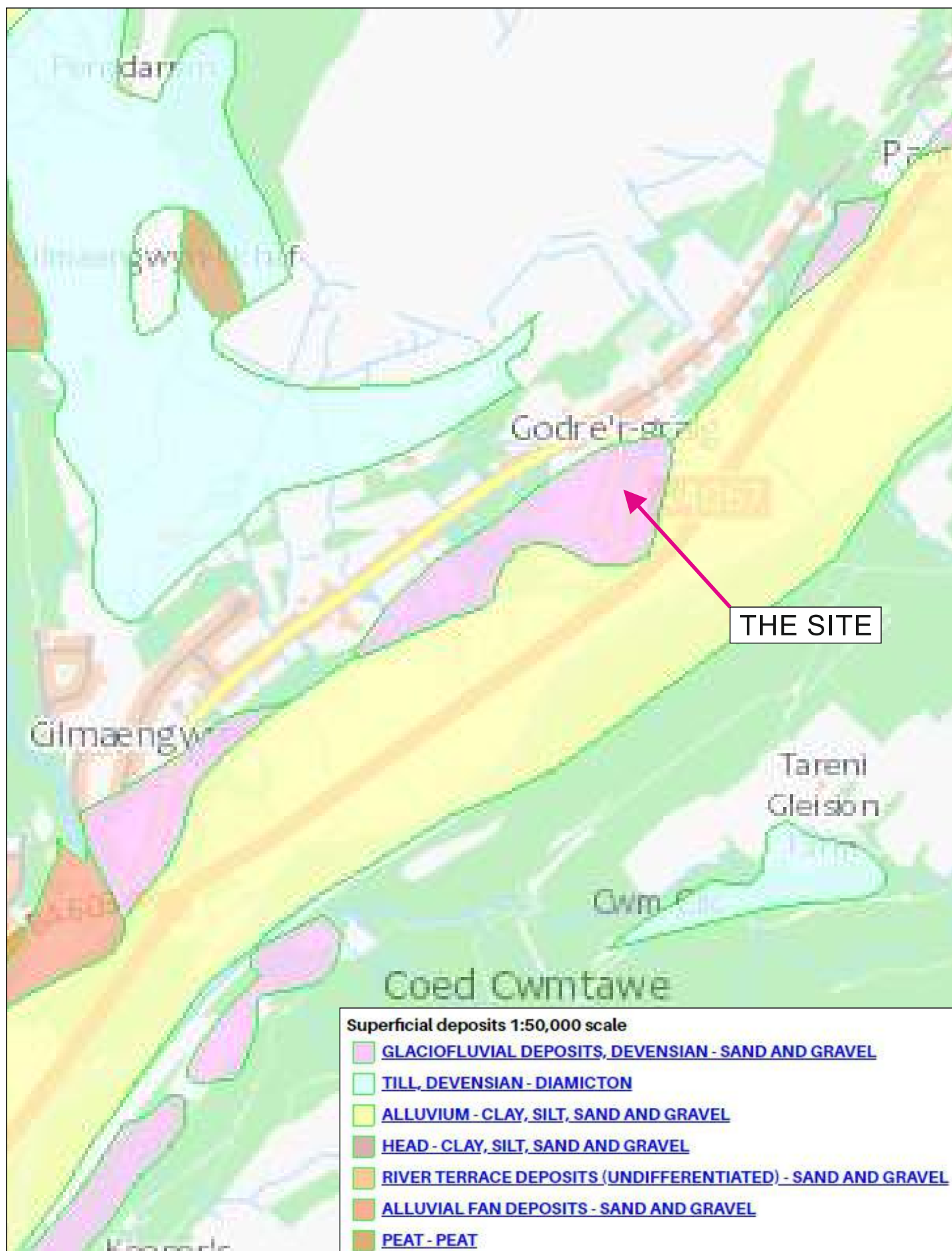


FIGURE 9
EXTRACT FROM THE B.G.S. GEOINDEX SHOWING
SUPERFICIAL DEPOSITS IN THE AREA OF THE SITE

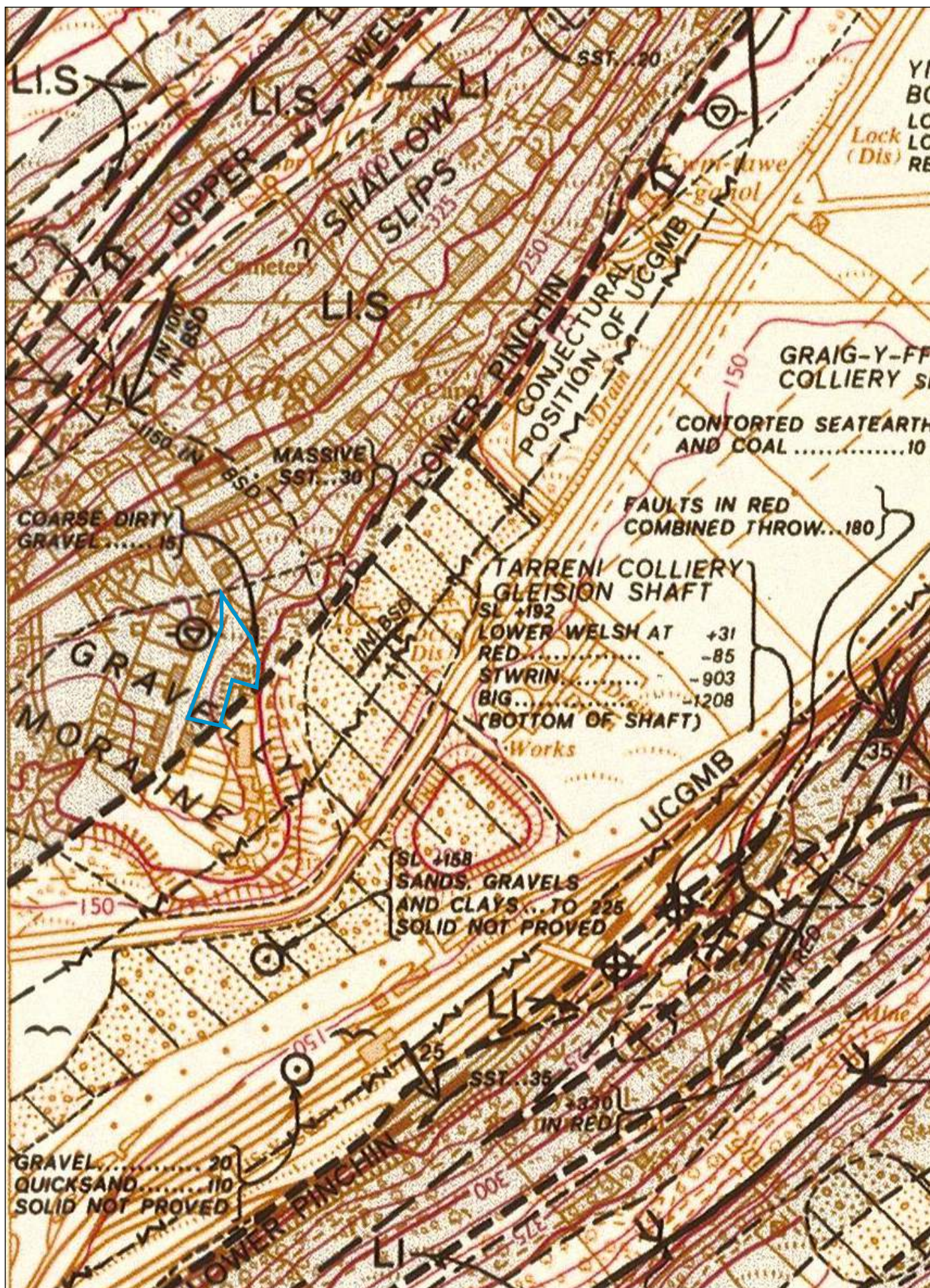


FIGURE 10
EXTRACT OF GEOLOGICAL SURVEY SHEET SN 70NE.
THE SITE IS HIGHLIGHTED IN BLUE

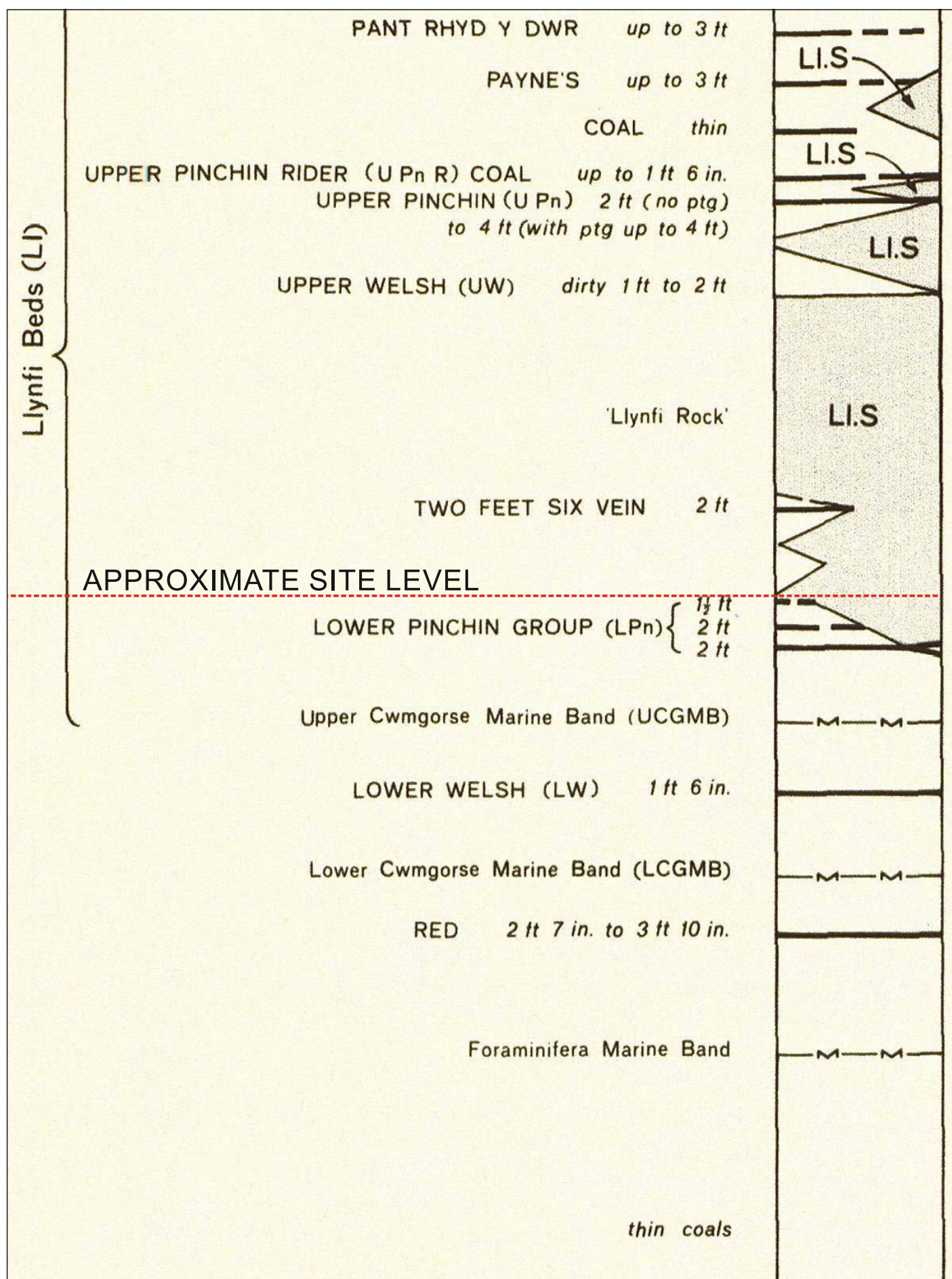


FIGURE 11
SECTION OF THE STRATIGRAPHIC COLUMN FROM SN 70NE.
THE APPROXIMATE SITE LEVEL IS MARKED

6. HYDROGEOLOGY

In the past when compiling a Part 1 Desk Study the necessary information about Hydrogeology could be obtained from the Environment Agency. In Wales this is no longer the case due to the N.R.W. (to whom the responsibilities of the E.A. have been devolved) failing to publish this information to date. It is now necessary to purchase the information off a private organisation such as Groundsure. This has been done for this report and the full Enviroinsight report is attached in Appendix A. All the information in the following section has been taken from the report. For ease of reference a diagram has been reproduced from the Enviroinsight report in this report. There is no intention on the Author's part to represent this as his own, and it remains copyright.

Figure 12, taken from the report, shows the Superficial Aquifer classification for the area. The site itself has a Secondary (A) Aquifer classification). Formerly known as Minor Aquifers the official definition is:- permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow in rivers. The aquifer takes in both the Fluvioglacial Gravels and the alluvium seen in Figure 9.

Page 47 of the Enviroinsight Report shows the bedrock aquifer classification. The entire area of the map is Secondary (A). For this reason it is not reproduced here Formerly known as Minor Aquifers the official definition is:- permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow in rivers.. This reflects the nature of the Middle Coal Measures in the area. Although predominantly argillaceous, there are permeable sandstone layers such as the Gorllwyn Rock. These sandstones have a low porosity but are highly permeable due to the well-developed jointing which allows high flow rates. However, because of the relative abundance of water in South Wales the only abstractions tend to be private wells on properties remote from mains supply.

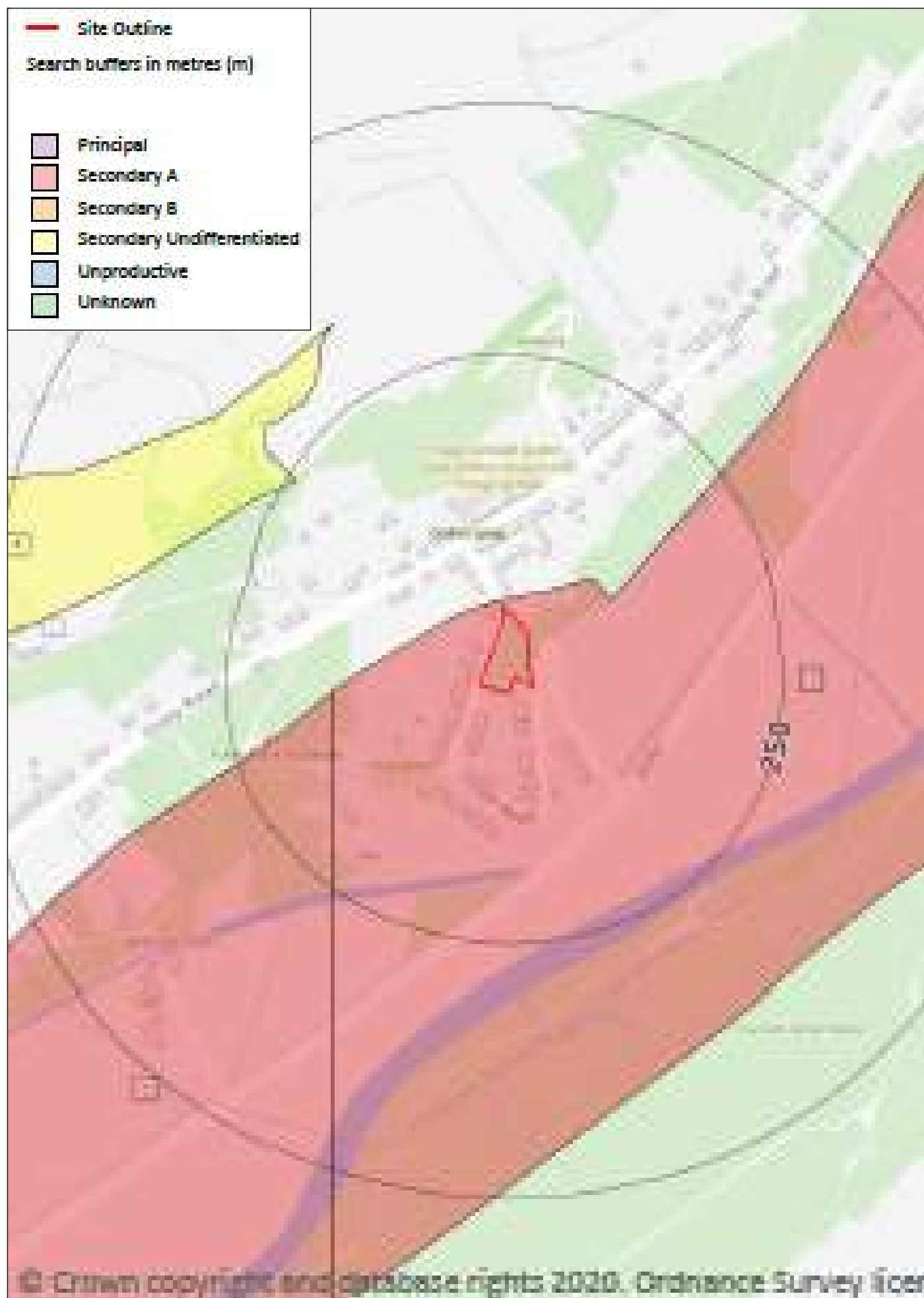


FIGURE 12
SUPERFICIAL AQUIFER FROM THE GROUNDSURE REPORT

7. HYDROLOGY

The Ordnance Survey Water Network Mastermap is on page 54 of the report. Under the Water Framework Directive the site is within the Tawe Water Body Catchment Area, Tawe Operational Catchment and Tawe-Cadoxton Management Catchment. The nearest major watercourse is the Afon Tawe. At its closest this is 246m from the site. The map shows several unnamed minor streams as close as 80m away.

8. ABSTRACTIONS

There is a single groundwater abstraction licences within 2000m. This is a spring used on a farm 305m southwest of the site. The Enviroinsight Report also states that there are three historic Surface Water Abstraction Licences. These are all further than 1500m from the site and all appear to have expired. There are no Source Protection Zones, or Source Protection Zones within Confined Aquifer in a 500m radius of the site.

9. POLLUTION INCIDENTS AND WATER QUALITY

There have been no Environment Agency/Natural Resources Wales Recorded Pollution Incidents from List 1 within 500m of the site. There have been three minor incidents recorded on List 2. The closest was 142m southeast of the site, a diesel spillage. One of these appears to be a minor fly tipping incident 348m away. The other is a sewage discharge 420m away. None of the recorded incidents would be anticipated to have any effect on the site.

There are no I.P.C. authorisations, Part A (1) or I.P.P.C. Authorised activities, Red List discharge consents or Dangerous/Radioactive Authorisations within 500m. There are no List 1 or List 2 Dangerous Substance Inventory Sites within 500m of the site. There are no records of Part A (2) and Part B Activities within 500m of the site. There are 13 licensed discharges to controlled waters including sewer overflows, farm effluent and several minewater discharges, the majority of them into the Tawe.

Under the Water framework Directive the Tawe has a Good ecological rating, a fail chemical rating and a Moderate overall rating in 2016. In the same year the W.F.D. rated the groundwater of the Swansea Carboniferous Coal Measures as Poor (Chemical and Overall) and Good for Quantitative.

10. LANDFILL

The landfill map is on page 34 of the Enviroinsight report. Three landfills are marked within 250m of the site. These are all historic, and recorded as coming from E.A./N.R.W. records but there are absolutely no details given. No operator, no license holder, no recorded dates, no waste type, waste license or surrender date. This is highly unusual. Often some details are missing, but never a complete blank. From their size, shape and position it seems obvious that they are the reinstated colliery spoil tips seen in Section 4. The source of the information was checked with Groundsure who confirmed the source was N.R.W. It would appear that the records come off historic mapping, in particular the 1970 1:2500, an extract of which is Figure 7. The three sites marked “tip disused” precisely match the outline of the “landfills” 1 and 2 on the Enviroinsight map. The map is reproduced here as Figure 13. One corner of the third site comes just within the 250m radius of the site. This actually has a name- Cilmaengwyn Waste Tip which inspires slightly more confidence, but again there are absolutely no details. Cilmaengwyn is a separate village from Godrergraig and is 750m from the site. The site shown on Figure 13 covers a Church and several houses, all of which have stood on the site since the 1920s. A small tip from a coal level is seen near Pentwyn House on early maps. Figure 14 shows the 2001 1:10,000 O.S. map. The modern revisions of this scale of map are very simplified compared to the detailed mapping of the past. It seems obvious comparing Figures 13 and 14 that the map is the source of the N.R.W. information. This cannot be confirmed, but it would appear that the N.R.W. information has come from some kind of desk study of O.S. mapping and is not based on any documentation, hence the lack of detail.

11. FLOOD RISK

The area is 200m outside the Low rating on the RoFRaS map. The height of the site above the valley bottom would make the risk of flooding remote. The map is included in the Enviroinsight report on pages 54-55.

12. ECOLOGICAL AND ARCHAEOLOGICAL CONSIDERATIONS

There are no known archaeological considerations. There are no known ecological considerations.

13. PREVIOUS CONTAMINATION STUDIES

There have been no previous desk based or intrusive contamination studies or I.P.P.C. investigations that the author is aware of.

14. LPA AND BUILDING CONTROL RECORDS

It is not anticipated that N.P.T. will hold any planning or building control records beyond the current application.

15. CONTAMINANTS OF CONCERN AND SOURCE AREAS

Certain industries such as gas and coke production produce a characteristic suite of contaminants. There has never been a contaminative use of the site, or indeed any sources of contamination anywhere near the site. It cannot completely be ruled out that Made ground could have been brought onto the site during the previous phase of development but it would be unlikely. Any Made Ground *could* contain sources of contaminants such as Heavy Metals, Asbestos, Polycyclic Aromatic Hydrocarbons (P.A.H.s) and Petroleum Hydrocarbons. The initial Qualitative Risk Assessment is shown in Table 1.

16. GROUND GAS POTENTIAL

The updated (2017) WLGA & NRW guidelines on the Development of Land Affected by Contamination state that “Ground gas is a contaminant and should be considered as a potential contaminant source in the preliminary risk assessment on sites where gas generation and /or migration is suspected”.

Dealing with the risk of migration first, the two most common sources for ground gas migrating onto a site from elsewhere are landfill sites and mines, particularly coal mines. Landfill sites have been found to be sources of gases, particularly methane, caused by the breakdown of organic material contained within them. There have been instances where migration of these gases has caused explosions or asphyxiation at receptors off site. These occurrences are rare and usually outside Britain in completely unregulated circumstances. In contrast, landfills in Britain have been tightly regulated and managed for many years, and a sense of perspective is necessary when assessing the threat from a landfill close to a site. At the present time “close” is generally being taken to mean 250m, although there are no specific studies that have arrived at this figure. Section 10 presented convincing evidence that the areas recorded as landfill by N.R.W. are in fact colliery spoil heaps. These do not contain biodegradable material and have no potential for gas production. Therefore they do not present a threat of gas migration to the site.

Moving on to coal mining, gas production was a constant problem during the coal mining heyday of the South Wales Valleys. The loss of life through explosion or

asphyxiation was huge. However, there were vast differences in the potential for gas production between different areas, and in different seams. As a generalisation, the deep steam coals of the Middle and Lower Coal Measures were the most problematic in the Glamorgan Valleys. The coal seams in this part of the Swansea Valley are Anthracite. Anthracite has a very low volatile content and has much less potential for gas generation. Most deep mines closed since nationalisation in 1947 had their shafts properly capped. This was not always the case in the past, and no details are available for the treatment of the Tarreni Shafts. The shafts form the obvious pathway for any gas to the surface, since naturally all the workings were connected to the shaft. This does not mean that they now form ongoing sources of mine gas, on the contrary they can be considered safe. There are two main reasons for this. Firstly, once coal cutting stops only a finite amount of gas is subsequently produced. This means, the longer production has ceased (in this case 71 years), the less potential there is for gas generation and the more chance that existing mine gas will have harmlessly vented. In addition once pumping ceases in any South Wales colliery, the mine will flood in a relatively short time (This does not hold true for all areas of Britain, some of which have different underlying geology). This prevents further Methane generation. So the Tarreni shafts can be discounted as sources of Methane generation. They are 400m from the site and a Coal Authority Mining Report on the site states there have never been any mine gas incidents within 50m of the site.

Having ruled out off-site migration from any possible sources it remains to assess the potential for on-site gas generation. This would be dependent on material being present on site that can produce gas. On this site peat and organic alluvium can be discounted because of the site's position and the previous information that the underlying material is Fluvioglacial gravel. This has a negligible organic content. The only other type of ground capable of gas generation is Fill/Made Ground. The Phase I indicates that there is a possibility of an unknown thickness of Made Ground on at least some of the site. The composition of any Made Ground is also unknown. Because of this it may have the potential to produce gas, but at this stage it is not possible to quantify this risk. The material will have to be examined during the intrusive site investigation as part of the Phase II report. The Part I report therefore concludes that while there is no risk of ground gas migrating from off-site sources, the possibility of on-site generation requires further investigation and quantification.

Finally, the site is within an area where less than 1% of properties are above the Radon Action Level. Because of this, no Radon protection measures will have to be used in the design and construction of the buildings. The initial Gas Risk Assessment is presented in Table 2 overleaf.

Both the Qualitative Risk Assessment and initial Ground Gas Risk Assessment are summarised in the Initial Conceptual Site Model in Figure 15.

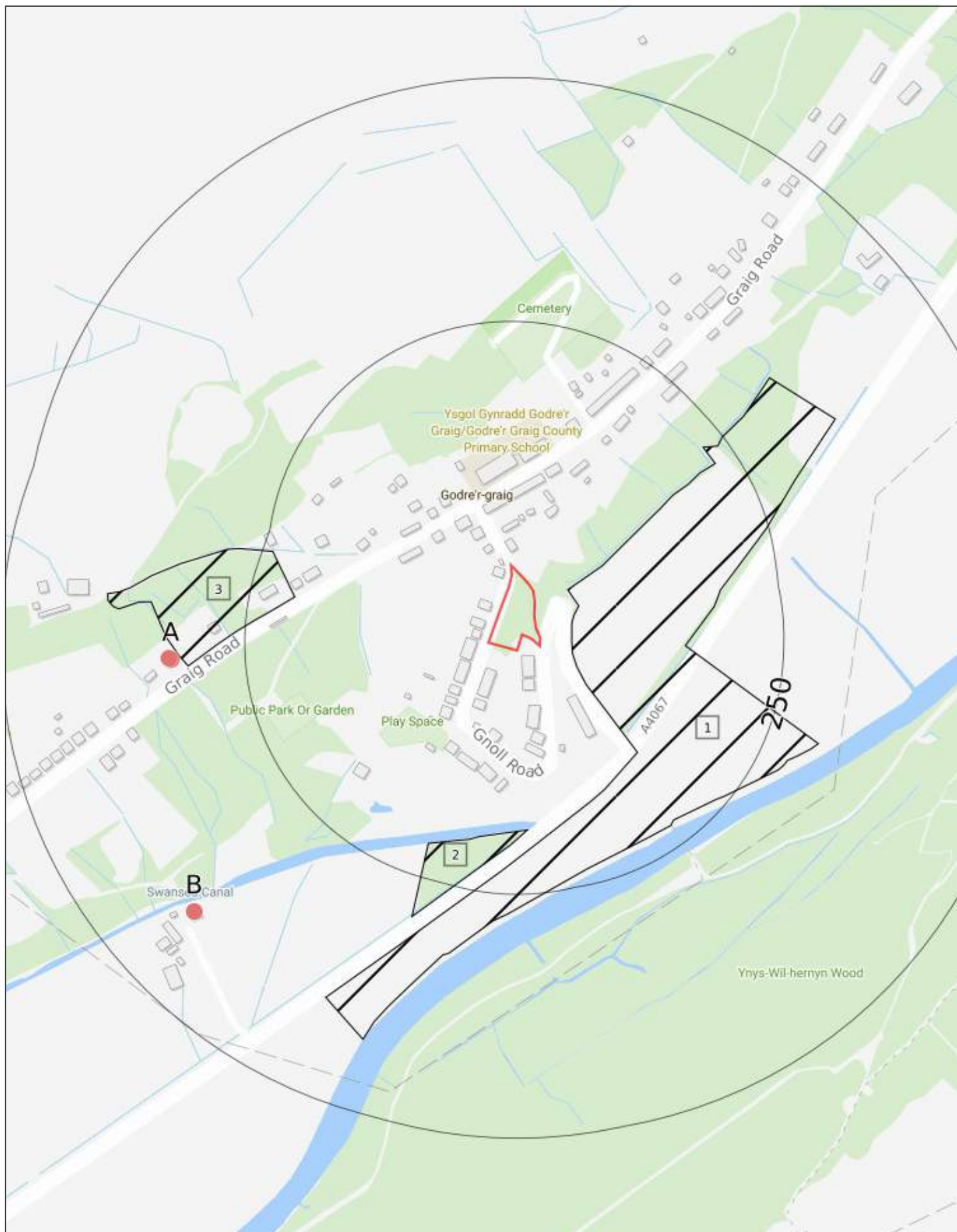


FIGURE 13
 LANDFILL MAP FROM THE GROUNDSURE GEOINSIGHT REPORT.
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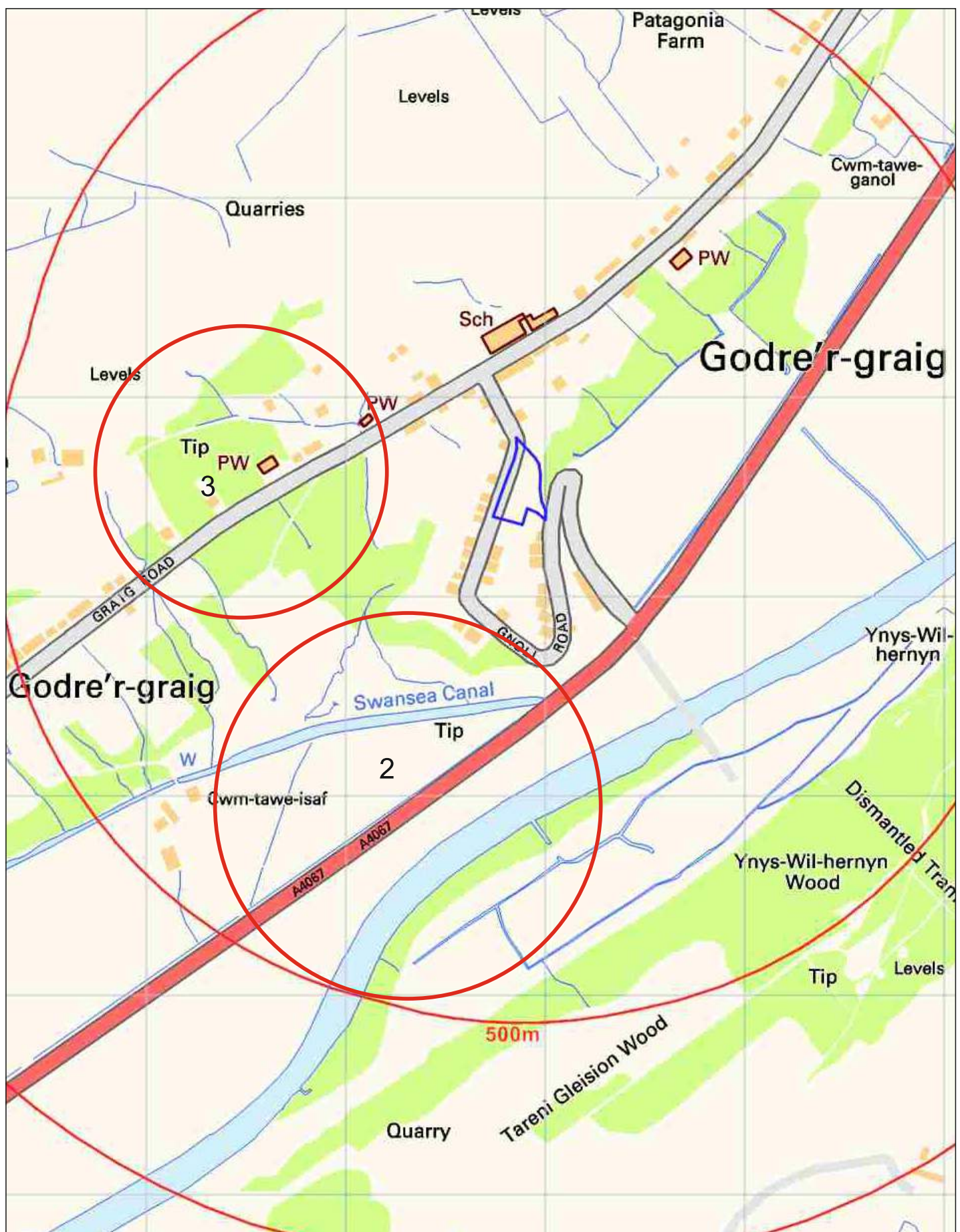


FIGURE 14

THE 2001 1:10,000 O.S. MAP. 120 YEARS OF DETAILED MAPPING REDUCED TO A SIMPLIFIED, AND LARGELY USELESS SKETCH. THE ORIGIN OF THE BOUNDARIES OF “LANDFILLS” 2 AND 3 JUMPS OUT AT THE VIEWER WHEN COMPARED TO FIGURE 13

TABLE 1						
QUALITATIVE HUMAN HEALTH RISK ASSESSMENT AND ENVIRONMENTAL RISK ASSESSMENT GNOLL ROAD, GODREGRAIG						
CONTAMINANT SOURCE	PATHWAYS	RECEPTORS	POTENTIAL SEVERITY	PROBABILITY OF RISK	LEVEL OF RISK	FURTHER ACTION REQUIRED
ON SITE: POTENTIAL CONTAMINATION IN SOILS. POSSIBLY ELEVATED LEVELS OF METALS, CYANIDE TPH AND PAH	INGESTION, DERMAL CONTACT, INHALATION	FUTURE END USERS, VISITORS	MEDIUM	MEDIUM	MEDIUM	CARRY OUT FULL SUITE OF SOIL TESTS
	CONTACT WITH CONTAMINATED GROUNDWATER	FUTURE END USERS, VISITORS AND CONSTRUCTION WORKERS	MEDIUM	MEDIUM	MEDIUM	TEST GROUNDWATER SAMPLES (IF PRESENT)
	PERMEATION OF WATER PIPES	FUTURE END USERS AND SITE VISITORS	MEDIUM			TEST SOIL AND GROUNDWATER
	INGESTION OF HOME GROWN PRODUCE	NONE	MEDIUM	MEDIUM	MEDIUM	CARRY OUT FULL SUITE OF SOIL TESTS
ON SITE: ASBESTOS AT OR NEAR GROUND SURFACE IN SOILS	INHALATION OF FIBRES IN AIRBORNE DUST	FUTURE END USERS AND SITE VISITORS	HIGH	MEDIUM	HIGH	SCREEN ALL SAMPLES FOR ASBESTOS
		CONSTRUCTION WORKERS	HIGH	MEDIUM	HIGH	
ON SITE: POTENTIAL CONTAMINATION IN SOILS. POSSIBLY ELEVATED LEVELS OF METALS, CYANIDE TPH AND PAH	RUN OFF	SURFACE DRAINAGE	MEDIUM	MEDIUM	MEDIUM	TEST GROUNDWATER SAMPLES AND RUN LEACHATE TESTS ON ANY SAMPLES SHOWING CONTAMINATION
	MIGRATION THROUGH SOIL VIA LEACHING	SHALLOW GROUNDWATER				
	ONWARD MIGRATION OF GROUNDWATER	BEDROCK AQUIFER				

TABLE 2 INITIAL GROUND GAS RISK ASSESSMENT AT GNOLL ROAD, GODRERGRAIG					
SOURCE	PATHWAY	RECEPTOR	CONSEQUENCE CLASSIFICATION	RISK	FURTHER ACTION
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	VERY LOW. NO RISK FROM MIGRATION OF LANDFILL GAS OR MINE GAS	NONE
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		NONE
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	MEDIUM.SLIGHT POSSIBILITY OF ON SITE GENERATION FROM MADE GROUND	FURTHER QUANTIFICATION AFTER INTRUSIVE INVESTIGATION
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		
RADON GAS	LONG TERM HAZARD FROM INHALATION	SITE USERS	SEVERE	VERY LOW. LESS THAN 1% OF PROPERTIES AFFECTED BY RADON	NO FURTHER ACTION REQUIRED

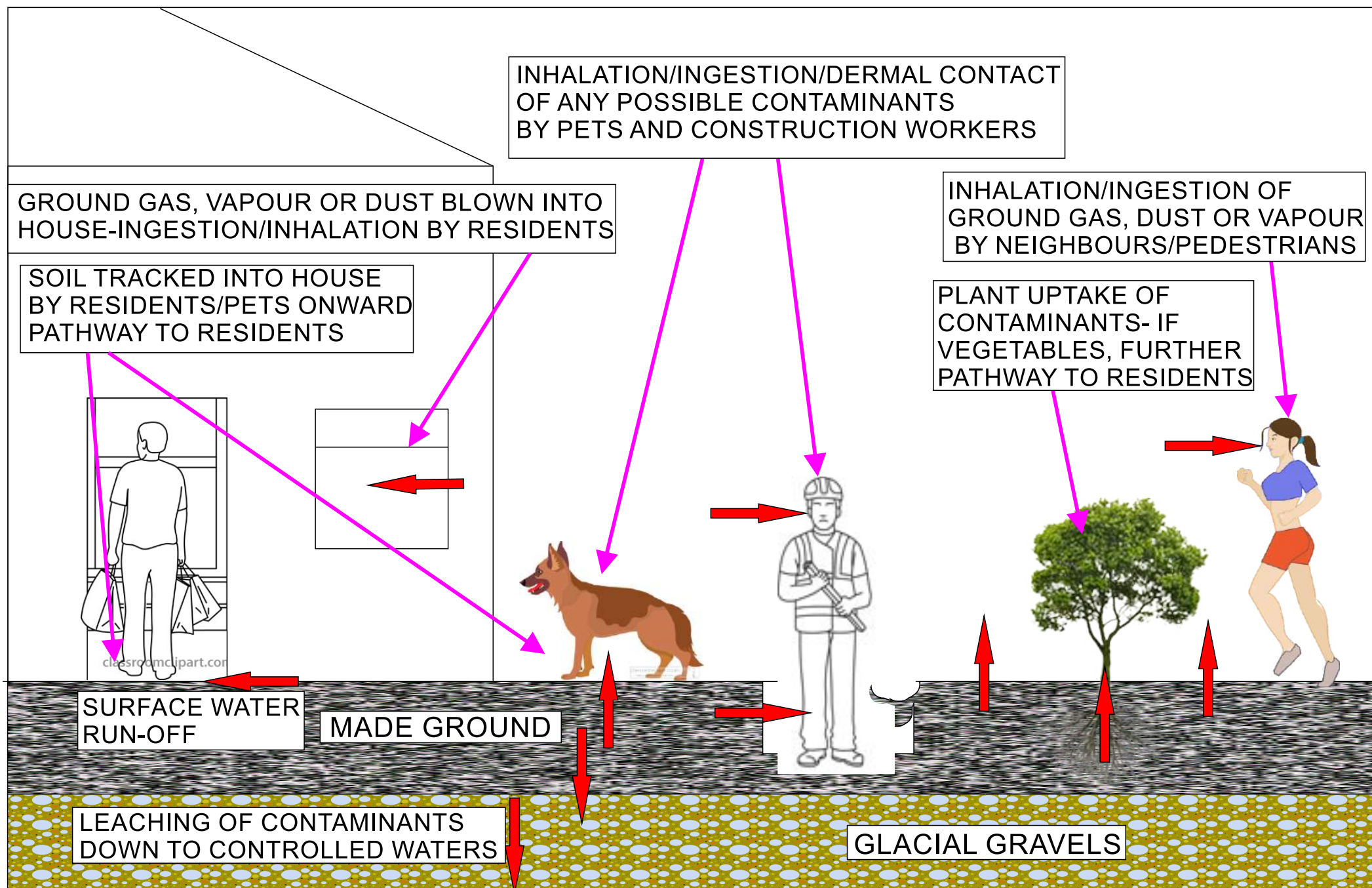


FIGURE 15
INITIAL CONCEPTUAL SITE MODEL SHOWING POSSIBLE SOURCE-PATHWAY-RECEPTORS.
THE MODEL MAKES THE ASSUMPTION MADE GROUND IS PRESENT ON-SITE.

17. POTENTIAL POLLUTANT LINKAGES IN THE C.S.M.

POTENTIAL CONTAMINANT-PATHWAY-RECEPTOR LINKAGES FOR RESIDENTIAL PROPERTIES ADJACENT TO, OR BUILT ON CONTAMINATED LAND

PATHWAYS:-

VAPOUR/GROUND GAS-AIR-INHALATION OR ABSORPTION THROUGH OTHER MEMBRANES

SOIL- INHALATION, INGESTION OR DERMAL CONTACT

GROUNDWATER-INHALATION, INGESTION OR DERMAL CONTACT

SURFACE WATER-INHALATION, INGESTION OR DERMAL CONTACT

ALL THE ABOVE ARE CONSIDERED POSSIBLE PATHWAYS TO HUMAN OR ANIMAL RECEPTORS.

GROUNDWATER AND SURFACE WATER ARE RECEPTORS IN THEIR OWN RIGHT (CONTROLLED WATERS) AS ARE PLANTS, ANIMALS AND THE ENVIRONMENT.

HUMAN RECEPTORS ON THE SITE WOULD INCLUDE:-

CONSTRUCTION WORKERS

USERS OF THE COMPLETED AMENITY

NEIGHBOURS

PASSING PEDESTRIANS/ WALKERS

TRESPASSERS

Surface water and groundwater make up the controlled waters considered as possible receptors for this site conceptual model. The reason for this is the possible leaching of contaminants from any Made Ground by rainwater then making its way downward through the underlying Secondary (A) Superficial Aquifer and downward into the Secondary (A) Bedrock Aquifer. Onward migration could then also possibly reach surface water such as the Swansea Canal and Afon Tawe. Surface run-off could also be considered as a possible pathway given the distance from the closest minor watercourse (80m). Ground gas from an on-site source is still being considered a possibility in the initial C.S.M.

18. INFORMATION GAPS AND UNCERTAINTIES

The biggest uncertainty in the conceptual model is the presence or absence of any Made Ground on the site. Following on from this is the likelihood of contaminants being present in the Made Ground.

The only certain way to answer this question is to carry out an intrusive site investigation, taking samples and testing them for contaminants. The site is relatively small, and the extent and depth of the Made Ground could be established by trial pitting. It is unlikely that the depth of any Made Ground would be beyond the reach of a medium sized excavator. Even if it was, an excavator could investigate material shallow enough to have a pathway to above ground receptors. If contaminants were detected, leachate tests could then be carried out to assess the risk to controlled waters.

There is no clearly defined source area for contaminants and so a general spread of sampling locations would be appropriate with a bias towards the proposed garden areas (this includes driveways, patios etc.). Depth of sampling would have to be decided on an ad hoc basis, depending on the ground conditions encountered. In addition to checking for solid or liquid contaminants, the potential for on-site ground gas generation could also be quantified once the extent and nature of any Made Ground was established.

PHASE 2

INTRODUCTION TO PHASE 2

As was stated in Phase 1, the intention is to proceed straight to Phase 2 without presenting Phase 1 to the L.P.A. For this reason, the initial five bullet points on checklist 2 of the W.L.C.W.G. template will not be repeated here as they are in the preceding Phase 1 desk study. It is intended that both phases will be reviewed together, as one document with no needless duplication of information.

19. SITE INVESTIGATION AND SAMPLING METHODOLOGY

On 8/09/2020 an intrusive site investigation was undertaken at the site. This consisted of the digging of trial pits with a 5-ton tracked excavator. The trial pit locations are shown in Figure 16 together with the depth of any samples taken. The footprints of the proposed buildings are also shown on the plan. The site had been scraped clear of vegetation and most of the site appeared to be natural ground. The southeast corner appeared to have Made Ground at the surface. This area is shown on Figure 16. Five pit locations were in garden or soft landscaping areas in a general spread across the site covered by the planning application. This was considered proportionate for an initial investigation of a site of this size. As stated in the final section of Phase 1, there was no specific source area for possible contamination. Four trial pits (TP1- TP4) were excavated entirely in natural ground. One trial pit was excavated through the Made Ground into undisturbed natural ground (TP5). There was no sensory field evidence of contamination detected anywhere on site. Groundwater was not encountered in any of the pits. A BRE365 Permeability test was carried out in TP1.

Each sampling location had four samples taken. These comprised two one litre plastic tubs, one 60ml. amber glass jar and one 120ml. amber glass jar. This is the recommended quantity required for a broad general suite of testing. The samples were taken with a stainless steel trowel, cleaned between samples to avoid cross contamination. The samples were stored in cool boxes and dispatched by courier to the laboratory the following morning. This meant that the lab was in receipt of the samples within 48 hours of them being taken, and they were kept under correct conditions throughout. This is important to ensure the samples are “non-deviating” particularly in the case of testing for organic contaminants.

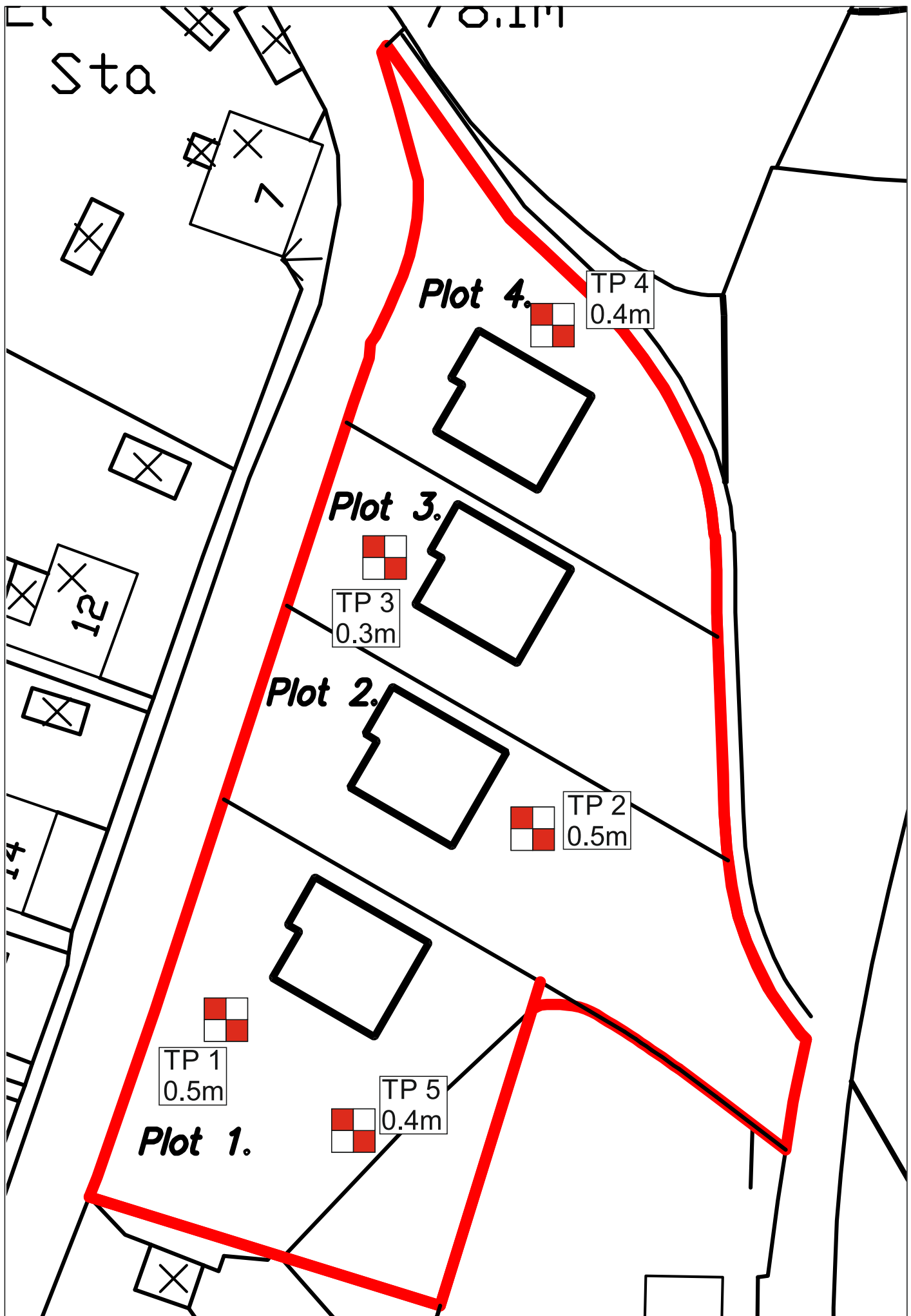


FIGURE 16
TRIAL PIT LOCATIONS AT KNOLL ROAD.

20. TESTING STRATEGY

All the samples were tested by The Environmental Laboratory Ltd (reg. 3882193) at their laboratory in East Sussex. They are one of the premier laboratories in the country. They have MCERTS and UKAS accreditation (UKAS lab no.2683). Their full details can be seen on the laboratory report 20-29814 ISSUE 2. The complete report is included as Appendix C. The report is fully secured, and the results cannot be altered by the recipient

As previously mentioned, there were no specific contaminants of concern identified in the Phase 1 desk study. Because of this a wide range of contaminants was tested for. This is the CLEA 2.1 Suite plus asbestos screen. The substances tested for could be described as a broad general suite in common use in British contaminated land studies. The substances can be split into two main categories. Organic and Inorganic compounds.

The inorganic contaminants tested for were metals:-

Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Zinc.

In addition, Free Cyanide was measured, and all samples were screened for Asbestos.

Total Organic Carbon and moisture were both measured. From this a calculation is used to derive Soil Organic Matter. This is needed to risk assess levels of P.A.H.'s, TPH's and Phenols which differ with varying S.O.M. values. A wide range of organic contaminants were tested for.

All samples were tested for P.A.H.s (Polycyclic Aromatic Hydrocarbons). Sixteen different compounds were measured. These are the USEPA16. Originating from the U.S.A. they are an internationally recognised, representative indicative group amongst the huge number of these compounds.

T.P.H. (total petroleum hydrocarbons) analysis was split up by Carbon Banding, along conventionally normal lines (Texas Banding). An aromatic/aliphatic split analysis was also carried out to allow further speciation of any hydrocarbon contamination detected.

The analysis for Organic contaminants also included a Phenol Suite. This contained a range of six Monohydric Phenols commonly found on contaminated sites.

21. CHOICE OF SUITABLE FOR USE VALUES (S4ULs) USED IN PHASE 2

Much work has been done in recent years on human health risk assessment for exposure to contaminated land. Originally the E.A. produced figures known as Soil Guidance Values (SGVs). These were later withdrawn, and this has resulted in the production of Generic Assessment Criteria (GACs). These are figures produced for individual substances. If the concentration of a contaminant is above its GAC, there is a potential for harm to human health (or controlled waters). Each contaminant has different levels for different exposure scenarios. For example, for any given contaminant, its GAC is far higher for a commercial development than it would be for Residential Use with consumption of homegrown produce. Many GACs have been published by Contaminated Land: Applications in real environments (CL:AIRE), Land Quality Management Ltd. (LQM) and the Environmental Industries Commission (EIC). Due to different bodies producing GACS over the years since they were introduced, LQM have produced a complete revision of their figures and renamed them Suitable for Use Levels (S4ULs). The values used in this report are S4ULs with the exception of Lead which has a Category 4 Screening Levels (C4SL). Cyanide is not assessed in this way, instead it has an acute GAC, rather than one modelled on long term exposure. Asbestos also has its own safety levels governing land use. The LQM S4ULs have been derived in accordance with the changes in exposure modelling presented within the C4SL framework, whilst still using a set of toxicological criteria that are set within the “minimal risk” range. The LQM/CIEH S4ULs were published to offer a set of collated information on the toxicity and transport properties for a number of common contaminants. They are widely considered to be suitable for use in planning assessments such as this. The most recent update was published in 2017 and reflects changes in UK human health risk assessment since the previous figures were published in 2009. All the data inputs used in the derivation of the S4ULs are presented in full in the publication LQM/CIEH Suitable 4 Use Levels and there is no intention to provide them here. These values are intended for use by professionals who have purchased them. To authenticate this the purchaser is supplied with an individual number to validate the report writer’s entitlement to use the LQM/CIEH S4ULs. This number can be seen on the result summary sheet. The author has the right to reproduce these values here, but they remain copyright of LQM, a specialist environmental consultancy based in Nottingham. As a conservative measure, the “with home grown produce” S4ULs will be used when analysing the results for risk assessment of the site.

22. SUMMARY OF GROUND CONDITIONS AND TEST RESULTS

The full borehole logs to BS5930:2015 together with photographs, can be found in Appendix B. As anticipated, four of the pits were entirely in natural ground. This was a slightly clayey Fluvioglacial gravel. In TP5 a sample was taken from the Made Ground. This was made up of ashy clinker and masonry, together with relatively recent building material which would appear to have been imported onto the site. It is highly likely that the source of the ashy clinker

The full laboratory reports are reproduced in Appendix C, as previously mentioned. For the benefit of anyone reviewing this report, a summary is produced overleaf in Tables 3-7. These compare the test results for each substance with its relevant S4UL value. As previously stated, the Residential with Produce S4ULs have been used in the summary tables overleaf. This is a conservative approach. With the organic contaminants the samples are normally subdivided based on their Soil Organic Matter (S.O.M.) as the S4UL value for each organic contaminant is controlled by the S.O.M. value. Three of the samples tested fell in the same S.O.M. band (>1% <2.5%). These included the sample from the Made ground. The other samples from the natural ground had a S.O.M. of >2.5% <6% so there are two different S4UL values for all the organic substances in Tables 3-5.

Every one of the P.A.H. range tested for was either below the level of detection, or present in minute quantities.

Every one of the T.P.H. range tested for was either below the level of detection, or present in minute quantities.

Because all the six speciated Phenols were below the level of detection in all samples, only the total Monohydric Phenol Index is shown, without speciation.

There was no Cyanide in any of the samples.

There was no Asbestos in any of the samples.

Of the other inorganic contaminants tested for (the Metals/ Metalloids) there was a single exceedance. This was Arsenic in TP2 at 0.5m. This was recorded as 51.4 mg/kg. The S4UL value is 37 mg/kg.

In summary there were no exceedances of any organic contaminants and a single exceedance of inorganic contaminants in the five samples tested.

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ALL VALUES ARE IN mg/kg

ALL S4ULs REFER TO RESIDENTIAL WITH HOMEGROWN PRODUCE SCENARIO

SOIL ORGANIC MATTER(S.O.M.)							
> 1%				> 2.5%			
CONTAMINANT	TP1 0.5m	TP3 0.3m	TP5 0.4m	S4UL	TP 2 0.5m	TP4 0.4m	S4UL
NAPHTHALENE	<0.1	<0.1	<0.1	2.3	<0.1	<0.1	5.6
ACENAPHTHYLENE	<0.1	<0.1	<0.1	170	<0.1	<0.1	420
ACENAPHTHENE	<0.1	<0.1	<0.1	210	<0.1	<0.1	510
FLOURENE	0.1	<0.1	<0.1	170	<0.1	<0.1	400
PHENANTHRENE	<0.1	<0.1	<0.1	95	0.2	<0.1	220
ANTHRACENE	<0.1	<0.1	<0.1	2400	<0.1	<0.1	5400
FLOURANTHENE	0.1	0.1	<0.1	280	0.7	<0.1	560
PYRENE	0.1	0.1	<0.1	620	0.6	<0.1	1200
BENZO[a]ANTHRACENE	<0.1	<0.1	<0.1	7.2	0.4	<0.1	11
CHRYSENE	<0.1	0.1	<0.1	15	0.5	<0.1	22
BENZO[b]FLOURANTHENE	<0.1	0.2	0.2	2.6	0.5	0.2	3.3
BENZO[k]FLOURANTHENE	<0.1	0.2	<0.1	77	0.6	<0.1	93
BENZO[a]PYRENE	<0.1	0.1	<0.1	2.2	0.5	<0.1	2.7
INDENO[1,2,3-cd]PYRENE	<0.1	<0.1	<0.1	27	0.3	<0.1	36
DIBENZO[a,h]ANTHRACENE	<0.1	<0.1	<0.1	0.24	<0.1	<0.1	0.28
BENZO[g,h,i]PERYLINE	<0.1	<0.1	0.1	320	0.3	<0.1	340
TOTAL(USEPA 16) PAHs	1.0	1.2	1.0	N/A	4.8	1	N/A
TABLE 3 POLYCYCLIC AROMATIC HYDROCARBONS (USEPA16)							

SUMMARY OF TEST RESULTS KNOLL TERRACE, GODREGRAIG

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ALL S4ULs REFER TO RESIDENTIAL WITH HOMEGROWN PRODUCE SCENARIO

S.O.M.		>1%				>2.5%		
CARBON BANDING		TP1 0.5m	TP3 0.3m	TP5 0.4m	S4UL	TP 2 0.5m	TP4 0.4m	S4UL
>C5-C6	ALI	<0.01	<0.01	<0.01	42	<0.01	<0.01	78
>C6-C8	ALI	<0.01	<0.01	<0.01	100	<0.01	<0.01	230
>C8-C10	ALI	<1	<1	<1	27	<1	<1	65
>C10-C12	ALI	<1	<1	<1	130	<1	<1	330
>C12-C16	ALI	<1	<1	<1	1100	<1	<1	2400
>C16-C21	ALI	<1	<1	<1	65000	<1	<1	92000
>C21-C35	ALI	<1	<1	<1		<1	<1	
>C35-C40	ALI	<1	<1	<1	65000	<1	<1	92000
TOTAL ALI	C5-C40	<1	<1	<1	N/A	<1	<1	N/A
>C5-C7	ARO	<0.01	<0.01	<0.01	70	<0.01	<0.01	140
>C7-C8	ARO	<0.01	<0.01	<0.01	130	<0.01	<0.01	290
>C8-C10	ARO	<1	<1	<1	34	<1	<1	83
>C10-C12	ARO	<1	<1	<1	74	<1	<1	180
>C12-C16	ARO	<1	<1	<1	140	<1	<1	330
>C16-C21	ARO	<1	<1	<1	260	<1	<1	540
>C21-C35	ARO	<1	<1	<1	1100	1.1	<1	1500
>C35-C40	ARO	<1	<1	<1	1100	<1	<1	1500
TOTAL ARO	C5-C40	<1	<1	<1	N/A	1.9	<1	N/A
TPH	C5-C40	<1	<1	<1	N/A	2.4	<1	N/A
TABLE 4 TOTAL PETROLEUM HYDROCARBONS WITH CARBON BANDING AND ALIPHATIC/AROMATIC SPLIT								

SUMMARY OF TEST RESULTS KNOLL TERRACE, GODREGRAIG

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ALL VALUES ARE IN mg/kg
ALL S4ULs REFER TO RESIDENTIAL WITH HOMEGROWN PRODUCE SCENARIO

S.O.M.	>1%				>2.5%		
	TP1 0.5m	TP3 0.3m	TP5 0.4m	S4UL	TP 2 0.5m	TP4 0.4m	S4UL
PHENOL	<5	<5	<5	280	<5	<5	550
TABLE 5 TOTAL MONOHYDRIC PHENOLS							
CONTAMINANT	TP1 0.5m.	TP3 0.3m	TP5 0.4m.	TP2 0.5m	TP4 0.4m	S4UL	
ARSENIC	16.9	17.2	19	51.4	19.8	37	
CADMIUM	<0.5	<0.5	<0.5	0.9	<0.5	11	
CHROMIUM	19.4	17.3	16.5	22.4	16.9	910	
COPPER	37	37.1	27.4	57.3	39.7	2400	
LEAD	34.2	27.7	20.8	62	27.6	200	(C4SL)
MERCURY	<0.5	<0.5	<0.5	<0.5	<0.5	40	
NICKEL	29.8	26.1	9.7	29.1	23.3	180	
SELENIUM	<1	<1	<1	1.6	<1	250	
ZINC	114	97.6	53.6	140	92.3	3700	
CYANIDE	<1.0	<1.0	<1.0	<1.0	<1.0	22	GACacute
TABLE 6 TOXIC/HEAVY METALS AND CYANIDE							
TRIAL PIT	TP1	TP3	TP5	TP2	TP4		
DEPTH (m.)	0.5m.	0.3m	0.4m.	0.5m	0.4m		
% DRY WEIGHT OF SAMPLE	0	0%	0	0	0		
FREE FIBRE ANALYSIS	0	0	0	0	0		
TABLE 7 ASBESTOS ANALYSIS							
SUMMARY OF TEST RESULTS KNOLL TERRACE, GODREGRAIG							

23. REVISED RISK ASSESSMENT FOR GROUND GAS

The Phase 1 established there was no threat of ground gas migration from off-site. This meant on-site generation by Made Ground was the only possible source of ground gas. The trial pitting established that the vast majority of the site is underlain by Fluvioglacial gravel with no potential for gas generation. This is particularly true of the ground beneath the proposed house footprints (ref. Figure 16). TPs 1-4 recorded no Made Ground. The only Made Ground is in a small area in the southeast corner of the site. The depth of this Made Ground was 0.8m. No biodegradable material was seen, the material being mainly ashy clinker. The laboratory testing gave a S.O.M. values of 1.7% for the sample taken at 0.4m in the Made Ground. This is low as regards potential for gas generation.

Because of the shallow depth, limited extent and the nature of the Made Ground (where encountered at all), the risk of on-site gas generation is non-existent. The site does not require any remediation work with regards to ground gas. This is reflected in the revised gas risk assessment (Table 8) and C.S.M. (Figure 17) presented overleaf.

24. RISK ASSESSMENT FOR CONTROLLED WATERS

There was an elevated level of Arsenic in one of the samples. There will be further comment on this in section 24. Since there was no groundwater to test it was decided to carry out leachate testing to assess the risk to controlled waters. The sample containing the elevated Arsenic was selected for 10:1 leachate preparation. The 10:1 method is considered superior to the old 2:1 method. The preparation of the leachate is meant to mimic the effect of rainwater/ groundwater on the contaminated sample in order to determine the mobility of any contaminants. The results can be seen on page 5 of the Elab report in Appendix C. The results showed that all metals, including Arsenic were below the detection limit of 5ug/l. This can only be due to the low solubility of the metallic compounds.

The soil at the site cannot possibly form a threat to controlled waters and can be safely removed from the revised risk assessment and C.S.M. (Figure 17)

25. REVISED RISK ASSESSMENT FOR SOILS

The vast majority of the site has no contamination whatsoever. The Arsenic exceedance could be regarded as a statistical outlier. However, since only five samples were tested, a more cautious approach would be to accept it at face value. The presence of Arsenic in the soil sample needs to be placed in context. Arsenic is a naturally occurring substance in many areas of Wales. In fact it is the 20th most abundant element in rocks worldwide. The 2013 Technical Guidance Sheet for Arsenic in Wales (DEFRA and B.G.S. joint publication) ascribes coal burning and metal smelting as common anthropogenic sources of Arsenic in soil, alongside wood preservatives. Colliery spoil is another source which brings Arsenic containing substances such as Iron Pyrites and Arsenopyrite to the surface. They can then oxidise and release Arsenic. The Tawe (Swansea) Valley is specifically mentioned in the document and classed as Urban 1 in the domain map. In this area the Normal Background Concentration (based on 342 samples) is 250mg/kg. This is five times higher than the level in the sample from TP2 and six and a half times greater than the S4UL for a residential property with homegrown produce. Arsenic has been retained in the revised C.S.M. in Figure 17.

26. SUMMARY OF REMEDIATION OBJECTIVES, CRITERIA AND OPTIONS

The objective of any remediation is obviously to make the land suitable for (in this case) residential use. In order to do that all the contaminant linkages shown in Figure 17 must be cut. The contaminant of concern was found in one location only. This was in natural ground and not linked to the extent of the Made Ground. The physical characteristics of the site mean that large amounts of soil are going to be moved around the site during the construction phase. This in turn means it is rather pointless to propose a remediation scheme based on the result of a single test at this stage. The response to the contaminant found has to be proportionate to the threat it poses. Any contractors working on the site will need to be made aware of the slight risk posed by a single relatively low Arsenic result. There will be no threat to human health from short term exposure during construction provided normal P.P.E. is specified in the risk assessment/ method statement of the construction firm.

It is believed the development will be phased with single houses being completed in order from south to north of the site. In this particular case it would be sensible to re-test the garden areas of the properties when each is

completed and prior to occupation as per planning condition 11. If contamination is then found in the garden areas they will need to be covered with a no-dig geotextile membrane and capped with a minimum of 600mm of inert material. This will then break the source-pathway-receptor linkage. In the case of designated garden areas it may be preferable to make up some of this thickness with imported certified topsoil or compost. If other inert material is imported this will also require certification. Capping is accepted as a suitable method of remediation and it is entirely feasible for the site to be made safe for residential use providing this is done. A final post-remediation C.S.M. is shown in Figure 18. This would only apply if capping was necessary. If no contamination was detected in the garden areas there is no source, and therefore no need to break any pathway.

Richard Davies BSc.(Hons.), MSc., F.G.S.

28/09/2020

TABLE 8 FINAL GROUND GAS RISK ASSESSMENT AT GNOLL ROAD, GODRERGRAIG					
SOURCE	PATHWAY	RECEPTOR	CONSEQUENCE CLASSIFICATION	RISK	FURTHER ACTION
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	VERY LOW. NO RISK FROM MIGRATION OF LANDFILL GAS OR MINE GAS	NONE
HAZARDOUS GROUND GAS FROM OFF SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		NONE
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	INHALATION, INJURY FROM EXPLOSION	SITE USERS, VISITORS, CONSTRUCTION WORKERS	SEVERE	VERY LOW. NO POTENTIAL FOR GENERATION BY MADE GROUND. NO ORGANIC ALLUVIUM PRESENT	NONE
HAZARDOUS GROUND GAS FROM ON SITE SOURCE	DAMAGE FROM EXPLOSION	BUILDINGS	SEVERE		
RADON GAS	LONG TERM HAZARD FROM INHALATION	SITE USERS	SEVERE	VERY LOW. LESS THAN 1% OF PROPERTIES AFFECTED BY RADON	NONE

TABLE 9						
QUANTITATIVE HUMAN HEALTH RISK ASSESSMENT AND ENVIRONMENTAL RISK ASSESSMENT LAND AT GNOLL ROAD, GODRERGRAIG						
CONTAMINANT SOURCE	PATHWAYS	RECEPTORS	POTENTIAL SEVERITY	PROBABILITY OF RISK	LEVEL OF RISK	FURTHER ACTION REQUIRED
ON SITE: POTENTIAL CONTAMINATION IN SOILS. POSSIBLY ELEVATED LEVELS OF METALS, CYANIDE TPH AND PAH	INGESTION, DERMAL CONTACT, INHALATION	FUTURE END USERS, VISITORS	MEDIUM	LOW	LOW	TESTING/VALIDATION OF GARDEN AREAS ON COMPLETION
	CONTACT WITH CONTAMINATED GROUNDWATER	FUTURE END USERS, VISITORS AND CONSTRUCTION WORKERS	MEDIUM	LOW	LOW	NO GROUNDWATER NO FURTHER ACTION REQUIRED
	PERMEATION OF WATER PIPES	FUTURE END USERS AND SITE VISITORS	MEDIUM			NO FURTHER ACTION REQUIRED
	INGESTION OF HOME GROWN PRODUCE	NONE	MEDIUM	LOW	LOW	TESTING/VALIDATION OF GARDEN AREAS ON COMPLETION
ON SITE: ASBESTOS AT OR NEAR GROUND SURFACE IN SOILS	INHALATION OF FIBRES IN AIRBORNE DUST	FUTURE END USERS AND SITE VISITORS	HIGH	LOW	LOW	NO ASBESTOS PRESENT. NO FURTHER ACTION REQUIRED
		CONSTRUCTION WORKERS	HIGH	LOW	LOW	
ON SITE: POTENTIAL CONTAMINATION IN SOILS. POSSIBLY ELEVATED LEVELS OF METALS, CYANIDE TPH AND PAH	RUN OFF	SURFACE DRAINAGE	MEDIUM	LOW	LOW	SINGLE EXCEEDANCE OF ARSENIC WITH NO LEACHING POTENTIAL NO FURTHER ACTION REQUIRED
	MIGRATION THROUGH SOIL VIA LEACHING	SHALLOW GROUNDWATER				
	ONWARD MIGRATION OF GROUNDWATER	BEDROCK AQUIFER				

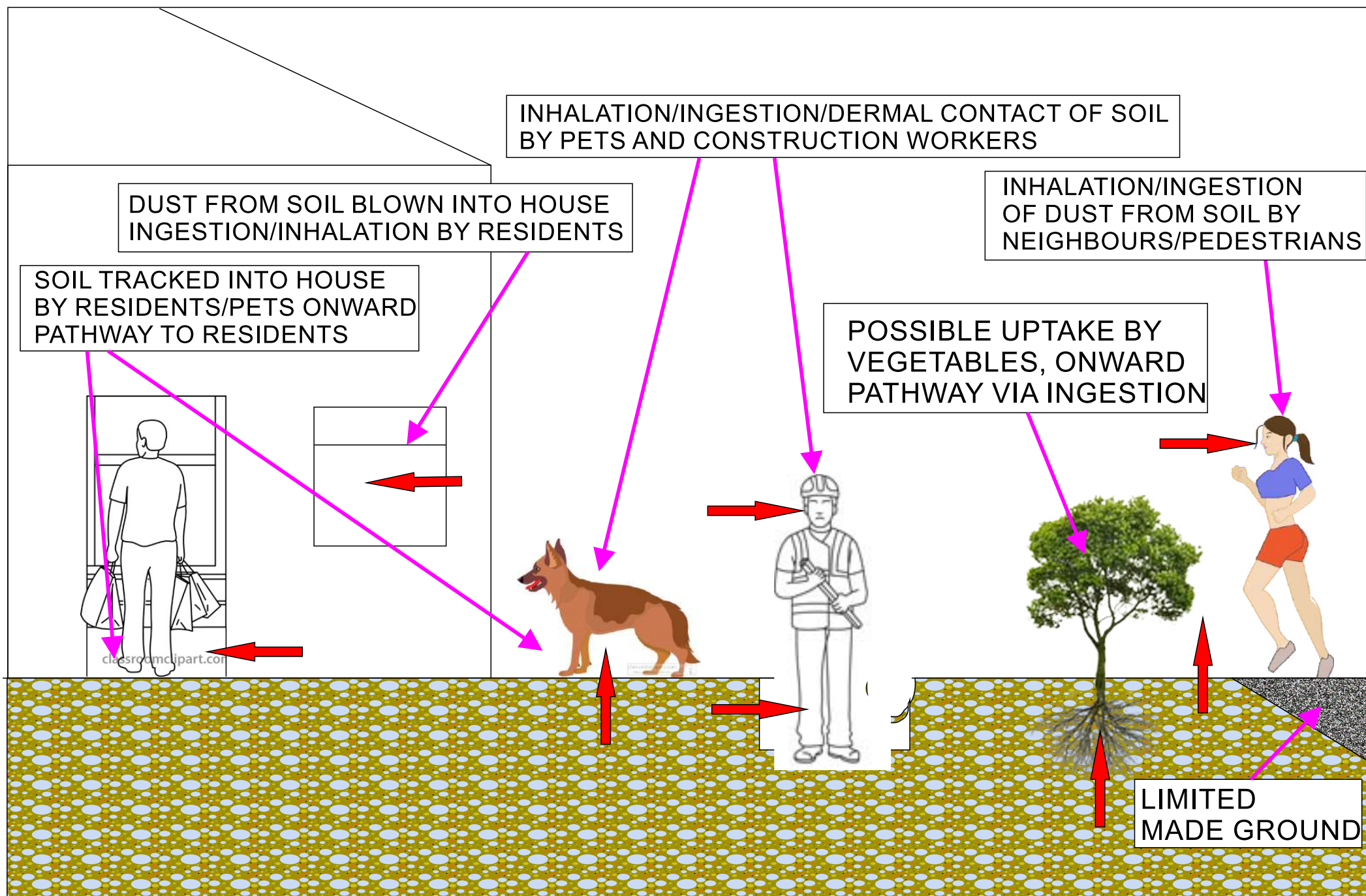


FIGURE 17
REVISED CONCEPTUAL MODEL OF SITE SHOWING REALISTIC SOURCE-PATHWAY-RECEPTORS₅₀

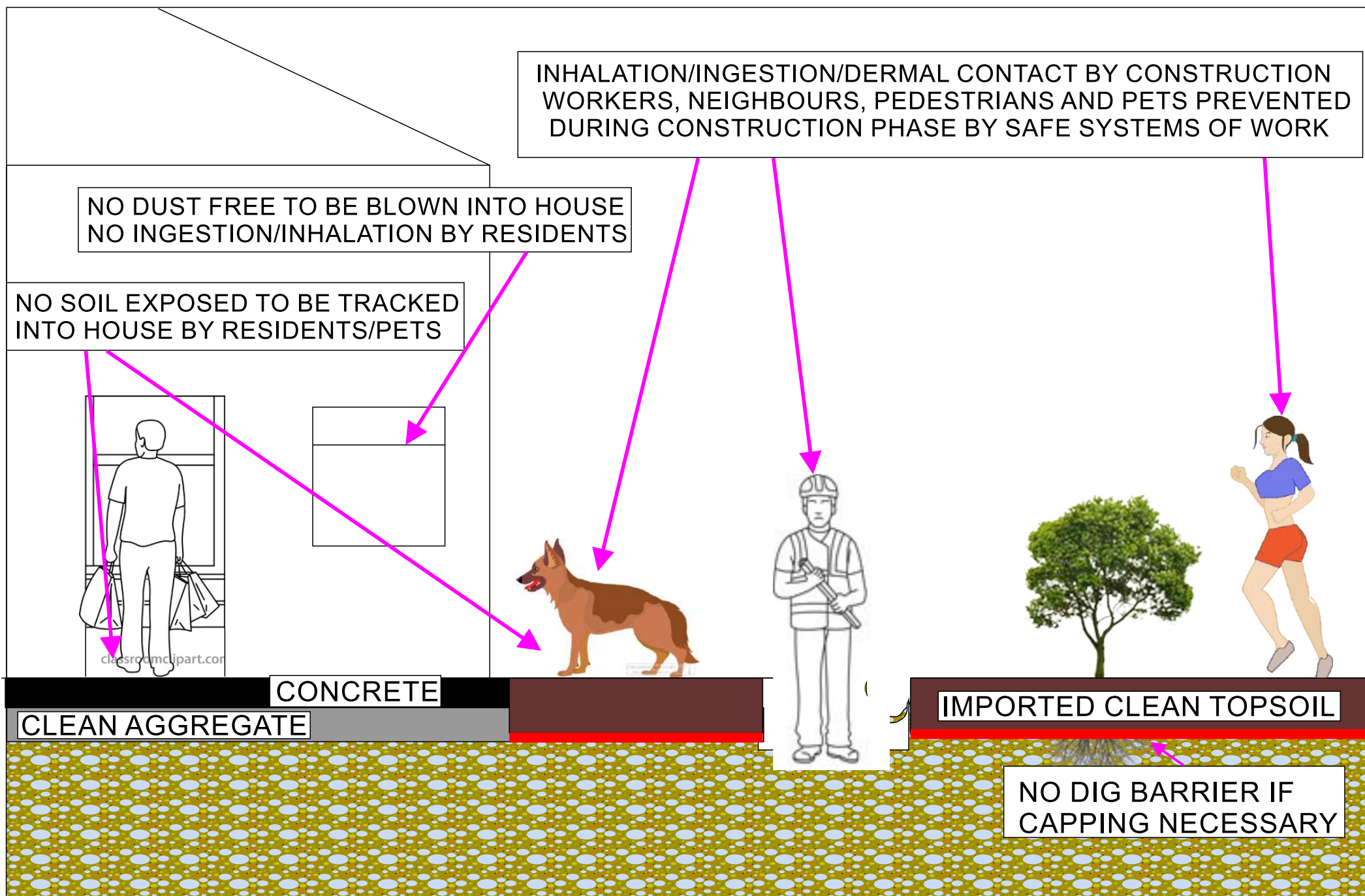


FIGURE 18 REVISED CONCEPTUAL MODEL OF SITE SHOWING ALL POTENTIAL PATHWAYS CUT DURING CONSTRUCTION BY WORK METHODS AND ON COMPLETION BY CAPPING (IF NECESSARY)

APPENDIX A
ENVIROINSIGHT AND GEOINSIGHT
GROUNDSURE REPORTS
FOR
SITE AT
GNOLL ROAD
GODREGRAIG

275184, 206710,

Order Details

Date: 02/09/2020
Your ref: GODREGRAIG
Our Ref: GS-7018000
Client: Rhondda Geotechnical Services

Site Details

Location: 275181 206714
Area: 0.25 ha
Authority: [Castell-nedd Port Talbot - Neath Port Talbot County Borough](#)



Summary of findings

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Aerial image

p. 8

OS MasterMap site plan

p.13

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08444 159 000

Summary of findings

Page	Section	Past land use	On site	0-50m	50-250m	250-500m	500-2000m
14	1.1	<u>Historical industrial land uses</u>	0	6	44	103	-
20	1.2	<u>Historical tanks</u>	0	0	5	3	-
21	1.3	<u>Historical energy features</u>	0	2	0	0	-
21	1.4	Historical petrol stations	0	0	0	0	-
21	1.5	<u>Historical garages</u>	0	0	1	0	-
22	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped	On site	0-50m	50-250m	250-500m	500-2000m
23	2.1	<u>Historical industrial land uses</u>	0	9	69	157	-
32	2.2	<u>Historical tanks</u>	0	0	5	6	-
33	2.3	<u>Historical energy features</u>	0	2	0	0	-
33	2.4	Historical petrol stations	0	0	0	0	-
33	2.5	<u>Historical garages</u>	0	0	2	0	-
Page	Section	Waste and landfill	On site	0-50m	50-250m	250-500m	500-2000m
34	3.1	Active or recent landfill	0	0	0	0	-
34	3.2	Historical landfill (BGS records)	0	0	0	0	-
35	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
35	3.4	<u>Historical landfill (EA/NRW records)</u>	0	1	2	0	-
36	3.5	Historical waste sites	0	0	0	0	-
36	3.6	Licensed waste sites	0	0	0	0	-
36	3.7	<u>Waste exemptions</u>	0	0	0	4	-
Page	Section	Current industrial land use	On site	0-50m	50-250m	250-500m	500-2000m
37	4.1	<u>Recent industrial land uses</u>	0	0	2	-	-
38	4.2	Current or recent petrol stations	0	0	0	0	-
38	4.3	Electricity cables	0	0	0	0	-
38	4.4	Gas pipelines	0	0	0	0	-
38	4.5	Sites determined as Contaminated Land	0	0	0	0	-



38	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
39	4.7	Regulated explosive sites	0	0	0	0	-
39	4.8	Hazardous substance storage/usage	0	0	0	0	-
39	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
39	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
39	4.11	Licensed pollutant release (Part A(2)/B)	0	0	0	0	-
40	4.12	Radioactive Substance Authorisations	0	0	0	0	-
40	4.13	<u>Licensed Discharges to controlled waters</u>	0	0	4	9	-
42	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
42	4.15	Pollutant release to public sewer	0	0	0	0	-
42	4.16	List 1 Dangerous Substances	0	0	0	0	-
42	4.17	<u>List 2 Dangerous Substances</u>	0	0	0	1	-
43	4.18	<u>Pollution Incidents (EA/NRW)</u>	0	0	2	2	-
43	4.19	Pollution inventory substances	0	0	0	0	-
44	4.20	Pollution inventory waste transfers	0	0	0	0	-
44	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
45	5.1	<u>Superficial aquifer</u>	Identified (within 500m)				
47	5.2	<u>Bedrock aquifer</u>	Identified (within 500m)				
49	5.3	<u>Groundwater vulnerability</u>	Identified (within 50m)				
50	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
50	5.5	Groundwater vulnerability- local information	None (within 0m)				
51	5.6	<u>Groundwater abstractions</u>	0	0	0	1	0
52	5.7	<u>Surface water abstractions</u>	0	0	0	0	3
53	5.8	Potable abstractions	0	0	0	0	0
53	5.9	Source Protection Zones	0	0	0	0	-
53	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology	On site	0-50m	50-250m	250-500m	500-2000m
54	6.1	<u>Water Network (OS MasterMap)</u>	0	1	30	-	-



57	6.2	<u>Surface water features</u>	0	1	18	-	-
57	6.3	<u>WFD Surface water body catchments</u>	1	-	-	-	-
58	6.4	<u>WFD Surface water bodies</u>	0	0	1	-	-
58	6.5	<u>WFD Groundwater bodies</u>	1	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
59	7.1	Risk of Flooding from Rivers and Sea (RoFRaS)	None (within 50m)				
60	7.2	<u>Historical Flood Events</u>	0	0	1	-	-
60	7.3	Flood Defences	0	0	0	-	-
60	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
60	7.5	Flood Storage Areas	0	0	0	-	-
61	7.6	Flood Zone 2	None (within 50m)				
61	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding					
62	8.1	Surface water flooding	Negligible (within 50m)				
Page	Section	Groundwater flooding					
63	9.1	<u>Groundwater flooding</u>	Low (within 50m)				
Page	Section	Environmental designations	On site	0-50m	50-250m	250-500m	500-2000m
64	10.1	<u>Sites of Special Scientific Interest (SSSI)</u>	0	0	0	0	5
65	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
65	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
65	10.4	Special Protection Areas (SPA)	0	0	0	0	0
66	10.5	National Nature Reserves (NNR)	0	0	0	0	0
66	10.6	<u>Local Nature Reserves (LNR)</u>	0	0	1	0	0
66	10.7	<u>Designated Ancient Woodland</u>	0	0	3	6	41
68	10.8	Biosphere Reserves	0	0	0	0	0
69	10.9	Forest Parks	0	0	0	0	0
69	10.10	Marine Conservation Zones	0	0	0	0	0
69	10.11	Green Belt	0	0	0	0	0
69	10.12	Proposed Ramsar sites	0	0	0	0	0



69	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
70	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
70	10.15	Nitrate Sensitive Areas	0	0	0	0	0
70	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
71	10.17	SSSI Impact Risk Zones	0	-	-	-	-
71	10.18	SSSI Units	0	0	0	0	0
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
72	11.1	World Heritage Sites	0	0	0	-	-
72	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
72	11.3	National Parks	0	0	0	-	-
72	11.4	Listed Buildings	0	0	0	-	-
73	11.5	Conservation Areas	0	0	0	-	-
73	11.6	Scheduled Ancient Monuments	0	0	0	-	-
73	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations	On site	0-50m	50-250m	250-500m	500-2000m
74	12.1	<u>Agricultural Land Classification</u>	Grade 3b (within 250m)				
75	12.2	Open Access Land	0	0	0	-	-
75	12.3	Tree Felling Licences	0	0	0	-	-
75	12.4	Environmental Stewardship Schemes	0	0	0	-	-
76	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations	On site	0-50m	50-250m	250-500m	500-2000m
77	13.1	Priority Habitat Inventory	0	0	0	-	-
77	13.2	Habitat Networks	0	0	0	-	-
77	13.3	Open Mosaic Habitat	0	0	0	-	-
77	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
78	14.1	<u>10k Availability</u>	Identified (within 500m)				
79	14.2	<u>Artificial and made ground (10k)</u>	0	1	3	4	-
81	14.3	<u>Superficial geology (10k)</u>	1	1	3	2	-

82	14.4	Landslip (10k)	0	0	0	0	-
83	14.5	<u>Bedrock geology (10k)</u>	1	1	8	15	-
85	14.6	<u>Bedrock faults and other linear features (10k)</u>	0	1	8	23	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
87	15.1	<u>50k Availability</u>	Identified (within 500m)				
88	15.2	<u>Artificial and made ground (50k)</u>	0	0	3	0	-
89	15.3	Artificial ground permeability (50k)	0	0	-	-	-
90	15.4	<u>Superficial geology (50k)</u>	1	0	2	1	-
91	15.5	<u>Superficial permeability (50k)</u>	Identified (within 50m)				
91	15.6	Landslip (50k)	0	0	0	0	-
91	15.7	Landslip permeability (50k)	None (within 50m)				
92	15.8	<u>Bedrock geology (50k)</u>	2	0	2	3	-
93	15.9	<u>Bedrock permeability (50k)</u>	Identified (within 50m)				
93	15.10	<u>Bedrock faults and other linear features (50k)</u>	1	0	3	6	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
95	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence					
96	17.1	<u>Shrink swell clays</u>	Very low (within 50m)				
97	17.2	<u>Running sands</u>	Very low (within 50m)				
99	17.3	<u>Compressible deposits</u>	Negligible (within 50m)				
100	17.4	<u>Collapsible deposits</u>	Very low (within 50m)				
101	17.5	<u>Landslides</u>	Very low (within 50m)				
102	17.6	<u>Ground dissolution of soluble rocks</u>	Negligible (within 50m)				
Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
104	18.1	Natural cavities	0	0	0	0	-
105	18.2	<u>BritPits</u>	0	0	1	13	-
107	18.3	<u>Surface ground workings</u>	0	3	65	-	-
110	18.4	<u>Underground workings</u>	0	0	0	33	98
115	18.5	Historical Mineral Planning Areas	0	0	0	0	-



<u>115</u>	<u>18.6</u>	<u>Non-coal mining</u>	1	0	1	1	0
<u>115</u>	<u>18.7</u>	<u>Mining cavities</u>	0	0	0	0	1
116	18.8	JPB mining areas	None (within 0m)				
<u>116</u>	<u>18.9</u>	<u>Coal mining</u>	Identified (within 0m)				
116	18.10	Brine areas	None (within 0m)				
116	18.11	Gypsum areas	None (within 0m)				
117	18.12	Tin mining	None (within 0m)				
117	18.13	Clay mining	None (within 0m)				
Page	Section	Radon					
<u>118</u>	<u>19.1</u>	<u>Radon</u>	Between 1% and 3% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
<u>120</u>	<u>20.1</u>	<u>BGS Estimated Background Soil Chemistry</u>	2	1	-	-	-
120	20.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
120	20.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
121	21.1	Underground railways (London)	0	0	0	-	-
121	21.2	Underground railways (Non-London)	0	0	0	-	-
122	21.3	Railway tunnels	0	0	0	-	-
<u>122</u>	<u>21.4</u>	<u>Historical railway and tunnel features</u>	0	5	5	-	-
122	21.5	Royal Mail tunnels	0	0	0	-	-
123	21.6	Historical railways	0	0	0	-	-
123	21.7	Railways	0	0	0	-	-
123	21.8	Crossrail 1	0	0	0	0	-
123	21.9	Crossrail 2	0	0	0	0	-
123	21.10	HS2	0	0	0	0	-

Recent aerial photograph



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Capture Date: 17/06/2017

Site Area: 0.25ha



Recent site history - 2014 aerial photograph



Capture Date: 23/07/2014

Site Area: 0.25ha



Recent site history - 2013 aerial photograph



Capture Date: 14/07/2013

Site Area: 0.25ha



Recent site history - 2010 aerial photograph



Capture Date: 22/05/2010

Site Area: 0.25ha



Recent site history - 2000 aerial photograph

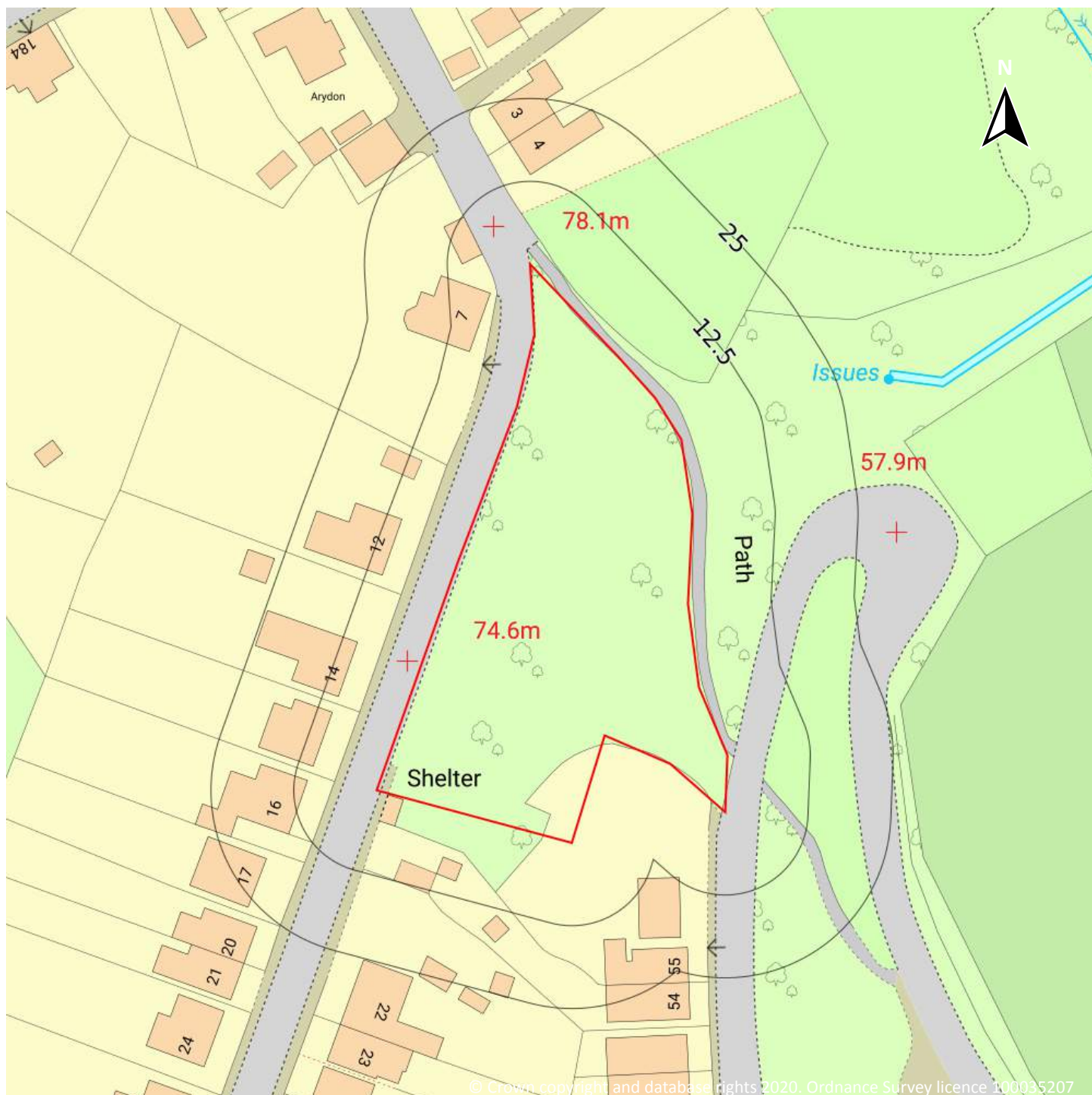


Capture Date: 18/06/2000

Site Area: 0.25ha



OS MasterMap site plan



Site Area: 0.25ha

- Site Outline
- Search buffers in metres (m)
-  Historical industrial land uses
 -  Historical tanks
 -  Historical energy features
 -  Historical garages

Records within 500m	153
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Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
B	27m E	Railway Sidings	1948	305948

ID	Location	Land use	Dates present	Group ID
B	30m E	Refuse Heaps	1965 - 1983	290436
C	30m E	Railway Sidings	1948	272480
D	30m E	Railway Sidings	1913	283463
C	38m E	Railway Sidings	1913	290838
C	40m E	Railway Sidings	1921	299092
B	57m E	Refuse Heap	1948	317166
B	65m E	Refuse Heap	1948	275846
E	92m NE	Unspecified Quarry	1913	309666
E	106m NE	Unspecified Quarry	1921 - 1948	312244
E	107m NE	Unspecified Quarry	1948	291115
E	108m NE	Unspecified Quarry	1913	300528
1	133m SW	Unspecified Heap	1980 - 1983	297224
G	141m SE	Sewage Works	1913	274893
G	142m SE	Sewage Works	1948	314928
H	147m SE	Unspecified Ground Workings	1983	266490
H	147m SE	Refuse Heaps	1965 - 1980	279269
I	151m SE	Refuse Heap	1913	273851
J	157m W	Refuse Heap	1948	295912
J	157m W	Refuse Heap	1921	271477
J	157m W	Refuse Heap	1913	309449
J	158m W	Refuse Heap	1948	281351
I	159m SE	Refuse Heap	1948	295818
G	160m E	Sewage Works	1913	307646
I	160m SE	Refuse Heap	1948	292426
I	161m SE	Refuse Heap	1913 - 1921	281799
G	162m E	Sewage Works	1948	304956
G	167m E	Sewage Works	1921	314675
H	171m SE	Railway Sidings	1948	305995

ID	Location	Land use	Dates present	Group ID
K	178m S	Refuse Heap	1948	290715
K	182m S	Refuse Heap	1948	279919
L	186m N	Burial Ground	1897 - 1913	310405
L	188m N	Burial Ground	1921 - 1948	277351
L	188m N	Cemetery	1877	296633
L	190m N	Cemetery	1965 - 1983	313435
L	190m N	Burial Ground	1948	293770
2	193m SW	Unspecified Ground Workings	1990	266491
G	195m E	Unspecified Works	1965 - 1980	309784
G	209m E	Unspecified Tanks	1965 - 1980	301009
G	209m E	Filter Beds	1913	284216
G	210m E	Unspecified Tank	1948	252783
G	210m E	Filter Beds	1948	283837
G	211m E	Unspecified Tanks	1913 - 1921	301341
G	216m E	Filter Beds	1921 - 1948	310098
G	216m E	Filter Beds	1948	310965
G	216m E	Filter Beds	1913	312227
G	225m E	Unspecified Tank	1948	252780
C	226m SE	Railway Sidings	1897 - 1913	286076
C	242m SE	Railway Sidings	1965	305345
G	242m E	Unspecified Tank	1948	252779
M	250m NW	Unspecified Old Quarry	1913 - 1948	306931
M	250m NW	Unspecified Old Quarry	1948	294569
M	254m NW	Unspecified Old Quarry	1913	316434
C	257m SE	Railway Sidings	1948	286918
N	257m SE	Unspecified Quarry	1948	258635
C	257m SE	Colliery	1913	274540
C	258m SE	Railway Building	1913	308452



ID	Location	Land use	Dates present	Group ID
C	260m SE	Railway Building	1913	303293
G	260m E	Unspecified Tank	1948	252796
M	260m NW	Unspecified Disused Quarry	1983	252270
C	262m SE	Railway Buildings	1921	251579
C	262m SE	Railway Building	1948	274261
C	263m SE	Railway Building	1948	312902
C	263m SE	Railway Building	1965	291281
C	264m SE	Railway Building	1913	281298
C	265m SE	Railway Building	1921 - 1948	276217
C	267m SE	Railway Building	1965	289314
C	267m SE	Unspecified Heap	1965 - 1983	293365
O	267m NW	Coal Level	1921	275843
O	269m NW	Unspecified Quarry	1913	278563
O	269m NW	Coal Level	1913	305245
O	269m NW	Coal Level	1897	313818
P	270m SE	Colliery	1921 - 1948	296770
M	273m NW	Unspecified Ground Workings	1877	266492
C	273m SE	Unspecified Ground Workings	1913	266512
C	274m S	Railway Buildings	1948	251580
3	274m NW	Old Coal Level	1897	264518
C	274m SE	Railway Building	1948	275960
O	275m NW	Unspecified Disused Levels	1964	250784
M	275m NW	Unspecified Old Quarry	1897	307782
C	276m SE	Unspecified Heap	1921	297674
C	284m S	Railway Building	1965	256652
Q	284m NE	Colliery	1948	281709
C	284m SE	Railway Building	1913 - 1921	288766
C	288m SE	Railway Building	1948	283630

ID	Location	Land use	Dates present	Group ID
C	288m SE	Railway Building	1913 - 1921	298235
O	291m NW	Unspecified Quarry	1948	286085
C	291m SE	Railway Building	1948 - 1965	297992
O	292m NW	Unspecified Ground Workings	1921	266489
O	292m NW	Unspecified Quarry	1897 - 1913	282681
M	299m NW	Unspecified Pit	1990	268461
4	300m N	Unspecified Disused Levels	1965 - 1983	302713
M	303m NW	Unspecified Quarry	1964	258633
M	303m NW	Unspecified Disused Levels	1965 - 1980	280563
O	306m NW	Unspecified Quarry	1877	288346
R	315m W	Refuse Heap	1948	284701
R	316m W	Refuse Heap	1948	313813
R	320m W	Coal Level	1948	287120
R	322m W	Coal Level	1948	271788
R	322m W	Coal Level	1948	274636
R	324m W	Coal Level	1913	276091
R	324m W	Coal Level	1913	278790
P	328m SE	Colliery	1913	317144
S	331m W	Unspecified Heap	1921	285864
S	333m W	Refuse Heap	1948	317175
S	334m W	Refuse Heap	1913	296187
S	337m W	Unspecified Heap	1948	287246
S	348m W	Refuse Heap	1948	287479
5	355m SE	Railway Building	1948	256651
C	363m S	Slurry Pond	1983	270401
6	364m SE	Tramway Sidings	1948	288788
R	364m W	Old Coal Level	1921	281665
R	366m W	Old Coal Level	1897 - 1913	282342

ID	Location	Land use	Dates present	Group ID
R	367m W	Old Coal Level	1948	297290
R	367m W	Unspecified Disused Levels	1964 - 1990	311565
R	367m W	Old Coal Level	1948	295538
C	375m S	Railway Building	1948	256653
T	395m W	Unspecified Quarry	1948	278173
T	396m W	Unspecified Quarry	1921	294498
T	399m W	Unspecified Quarry	1913	281388
T	400m W	Unspecified Quarry	1897	283785
T	400m W	Unspecified Quarry	1913	287041
P	400m E	Railway Building	1913 - 1921	312979
U	401m W	Refuse Heap	1921 - 1948	313531
T	403m W	Unspecified Quarry	1948	280683
U	404m W	Refuse Heap	1913	310187
U	404m W	Refuse Heap	1948	314957
P	405m SE	Unspecified Disused Mine	1965 - 1983	285747
7	409m NE	Unspecified Heap	1983	260073
N	411m SE	Unspecified Ground Workings	1913	309005
N	412m SE	Unspecified Heap	1948	299662
N	412m SE	Unspecified Ground Workings	1921	289971
N	413m SE	Unspecified Ground Workings	1913	303391
W	414m N	Unspecified Disused Levels	1983	250786
P	415m SE	Unspecified Ground Workings	1913 - 1921	300267
N	416m SE	Unspecified Heap	1948 - 1983	316796
W	423m N	Old Coal Level	1948	305085
W	424m N	Old Coal Level	1897 - 1913	285669
W	425m N	Old Coal Level	1913 - 1948	281238
W	432m N	Coal Level	1897	292828
W	432m N	Coal Level	1913	302687



ID	Location	Land use	Dates present	Group ID
W	432m N	Coal Level	1948	279406
W	433m N	Coal Level	1913 - 1921	306449
X	450m E	Unspecified Heap	1948	297792
X	451m E	Unspecified Heaps	1913	273953
W	452m N	Unspecified Disused Levels	1983	250788
X	453m E	Unspecified Heap	1913 - 1921	316625
X	453m E	Unspecified Heaps	1948	289662
X	461m E	Unspecified Heaps	1965 - 1983	290608
8	491m E	Unspecified Pit	1983	268462
Q	497m N	Coal Level	1948	270707
Q	499m N	Coal Level	1948	270716
Q	500m N	Unspecified Old Quarries	1913	304618

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

8

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
F	92m N	Tank or Trough	1877	34509
F	100m N	Tank or Trough	1877	34507
G	210m E	Tanks	1960	34863
G	213m E	Tanks	1918	34862
G	239m E	Tanks	1918	34861
V	402m SW	Unspecified Tank	1993	35326



ID	Location	Land use	Dates present	Group ID
P	402m SE	Unspecified Tank	1960 - 1993	36235
V	403m SW	Unspecified Tank	1960 - 1971	35363

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m

2

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
A	20m NW	Electricity Substation	1993	18649
A	24m NW	Electricity Substation	1971	18692

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

1

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-



grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 14**

ID	Location	Land use	Dates present	Group ID
D	66m SE	Garage	1971 - 1993	6526

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



[illegible]

- Site Outline
- Search buffers in metres (m)
-  Historical industrial land uses
 -  Historical tanks
 -  Historical energy features
 -  Historical garages

Records within 500m	235
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Features are displayed on the Past land use - un-grouped map on **page 23**

ID	Location	Land Use	Date	Group ID
B	27m E	Railway Sidings	1948	305948
B	30m E	Refuse Heaps	1965	290436
B	30m E	Refuse Heaps	1980	290436

ID	Location	Land Use	Date	Group ID
B	30m E	Refuse Heaps	1983	290436
C	30m E	Railway Sidings	1948	272480
D	30m E	Railway Sidings	1913	283463
C	38m E	Railway Sidings	1913	290838
C	38m E	Railway Sidings	1913	290838
C	40m E	Railway Sidings	1921	299092
B	57m E	Refuse Heap	1948	317166
B	65m E	Refuse Heap	1948	275846
B	65m E	Refuse Heap	1948	275846
E	92m NE	Unspecified Quarry	1913	309666
E	92m NE	Unspecified Quarry	1913	309666
E	106m NE	Unspecified Quarry	1948	312244
E	107m NE	Unspecified Quarry	1948	291115
E	108m NE	Unspecified Quarry	1913	300528
E	108m NE	Unspecified Quarry	1921	312244
G	133m SW	Unspecified Heap	1980	297224
G	133m SW	Unspecified Heap	1983	297224
H	141m SE	Sewage Works	1913	274893
H	142m SE	Sewage Works	1948	314928
I	147m SE	Refuse Heaps	1965	279269
I	147m SE	Refuse Heaps	1980	279269
I	147m SE	Unspecified Ground Workings	1983	266490
J	151m SE	Refuse Heap	1913	273851
J	151m SE	Refuse Heap	1913	273851
K	157m W	Refuse Heap	1948	295912
K	157m W	Refuse Heap	1913	309449
K	157m W	Refuse Heap	1921	271477
K	158m W	Refuse Heap	1948	281351

ID	Location	Land Use	Date	Group ID
K	158m W	Refuse Heap	1948	281351
J	159m SE	Refuse Heap	1948	295818
J	159m SE	Refuse Heap	1948	295818
H	160m E	Sewage Works	1913	307646
H	160m E	Sewage Works	1913	307646
J	160m SE	Refuse Heap	1948	292426
J	161m SE	Refuse Heap	1913	281799
J	161m SE	Refuse Heap	1921	281799
H	162m E	Sewage Works	1948	304956
H	162m E	Sewage Works	1948	304956
H	167m E	Sewage Works	1921	314675
I	171m SE	Railway Sidings	1948	305995
L	178m S	Refuse Heap	1948	290715
L	182m S	Refuse Heap	1948	279919
L	182m S	Refuse Heap	1948	279919
M	186m N	Burial Ground	1913	310405
M	186m N	Burial Ground	1897	310405
M	188m N	Burial Ground	1921	277351
M	188m N	Cemetery	1877	296633
M	190m N	Cemetery	1965	313435
M	190m N	Cemetery	1980	313435
M	190m N	Cemetery	1983	313435
M	190m N	Burial Ground	1948	293770
M	190m N	Burial Ground	1948	277351
M	191m N	Burial Ground	1913	310405
M	191m N	Burial Ground	1913	310405
1	193m SW	Unspecified Ground Workings	1990	266491
H	195m E	Unspecified Works	1965	309784

ID	Location	Land Use	Date	Group ID
H	195m E	Unspecified Works	1980	309784
H	209m E	Unspecified Tanks	1965	301009
H	209m E	Unspecified Tanks	1980	301009
H	209m E	Filter Beds	1913	284216
H	209m E	Filter Beds	1913	284216
H	210m E	Unspecified Tank	1948	252783
H	210m E	Filter Beds	1948	283837
H	210m E	Filter Beds	1948	283837
H	211m E	Unspecified Tanks	1913	301341
H	212m E	Unspecified Tanks	1921	301341
H	216m E	Filter Beds	1948	310098
H	216m E	Filter Beds	1948	310098
H	216m E	Filter Beds	1948	310965
H	216m E	Filter Beds	1913	312227
H	219m E	Filter Beds	1921	310098
H	225m E	Unspecified Tank	1948	252780
C	226m SE	Railway Sidings	1913	286076
C	242m SE	Railway Sidings	1965	305345
H	242m E	Unspecified Tank	1948	252779
N	250m NW	Unspecified Old Quarry	1948	306931
N	250m NW	Unspecified Old Quarry	1948	294569
N	252m NW	Unspecified Old Quarry	1913	306931
N	253m NW	Unspecified Old Quarry	1921	306931
N	254m NW	Unspecified Old Quarry	1913	316434
N	254m NW	Unspecified Old Quarry	1913	316434
C	257m SE	Railway Sidings	1948	286918
O	257m SE	Unspecified Quarry	1948	258635
C	257m SE	Colliery	1913	274540



ID	Location	Land Use	Date	Group ID
C	257m SE	Colliery	1913	274540
C	258m SE	Railway Building	1913	308452
C	260m SE	Railway Building	1913	303293
H	260m E	Unspecified Tank	1948	252796
N	260m NW	Unspecified Disused Quarry	1983	252270
C	262m SE	Railway Buildings	1921	251579
C	262m SE	Railway Building	1948	274261
C	263m SE	Railway Building	1948	312902
C	263m SE	Railway Building	1965	291281
C	264m SE	Railway Building	1913	281298
C	265m SE	Railway Building	1948	276217
C	266m SE	Railway Building	1921	276217
C	267m SE	Railway Building	1965	289314
C	267m SE	Unspecified Heap	1965	293365
C	267m SE	Unspecified Heap	1980	293365
C	267m SE	Unspecified Heap	1983	293365
P	267m NW	Coal Level	1921	275843
P	269m NW	Coal Level	1913	305245
P	269m NW	Coal Level	1897	313818
P	269m NW	Unspecified Quarry	1913	278563
P	269m NW	Unspecified Quarry	1913	278563
Q	270m SE	Colliery	1948	296770
Q	270m SE	Colliery	1948	296770
N	273m NW	Unspecified Ground Workings	1877	266492
C	273m SE	Unspecified Ground Workings	1913	266512
C	274m S	Railway Buildings	1948	251580
2	274m NW	Old Coal Level	1897	264518
C	274m SE	Railway Building	1948	275960



ID	Location	Land Use	Date	Group ID
P	275m NW	Unspecified Disused Levels	1964	250784
N	275m NW	Unspecified Old Quarry	1897	307782
C	276m SE	Unspecified Heap	1921	297674
C	284m S	Railway Building	1965	256652
R	284m NE	Colliery	1948	281709
C	284m SE	Railway Building	1913	288766
C	287m SE	Railway Building	1921	288766
C	288m SE	Railway Building	1948	283630
C	288m SE	Railway Building	1913	298235
P	291m NW	Unspecified Quarry	1948	286085
C	291m SE	Railway Building	1948	297992
P	292m NW	Unspecified Ground Workings	1921	266489
P	292m NW	Unspecified Quarry	1897	282681
C	293m SE	Railway Building	1921	298235
P	293m NW	Unspecified Quarry	1913	282681
P	293m NW	Unspecified Quarry	1948	286085
C	297m SE	Railway Building	1965	297992
N	299m NW	Unspecified Pit	1990	268461
S	300m N	Unspecified Disused Levels	1965	302713
S	300m N	Unspecified Disused Levels	1980	302713
S	300m N	Unspecified Disused Levels	1983	302713
N	303m NW	Unspecified Quarry	1964	258633
N	303m NW	Unspecified Disused Levels	1965	280563
N	303m NW	Unspecified Disused Levels	1980	280563
P	306m NW	Unspecified Quarry	1877	288346
T	315m W	Refuse Heap	1948	284701
T	315m W	Refuse Heap	1948	284701
T	316m W	Refuse Heap	1948	313813



ID	Location	Land Use	Date	Group ID
T	320m W	Coal Level	1948	287120
T	322m W	Coal Level	1948	274636
T	322m W	Coal Level	1948	271788
T	324m W	Coal Level	1913	276091
T	324m W	Coal Level	1913	278790
Q	328m SE	Colliery	1913	317144
U	331m W	Unspecified Heap	1921	285864
C	332m SE	Railway Sidings	1897	286076
U	333m W	Refuse Heap	1948	317175
U	334m W	Refuse Heap	1913	296187
U	337m W	Unspecified Heap	1948	287246
U	337m W	Unspecified Heap	1948	287246
U	348m W	Refuse Heap	1948	287479
U	348m W	Refuse Heap	1948	287479
3	355m SE	Railway Building	1948	256651
C	363m S	Slurry Pond	1983	270401
O	364m SE	Tramway Sidings	1948	288788
T	364m W	Old Coal Level	1921	281665
T	366m W	Old Coal Level	1913	282342
T	366m W	Old Coal Level	1897	282342
T	367m W	Unspecified Disused Levels	1990	311565
T	367m W	Old Coal Level	1948	297290
T	367m W	Old Coal Level	1948	297290
T	367m W	Old Coal Level	1948	295538
Q	368m SE	Colliery	1921	296770
O	369m SE	Tramway Sidings	1948	288788
T	370m W	Old Coal Level	1913	282342
T	370m W	Old Coal Level	1913	282342



ID	Location	Land Use	Date	Group ID
T	372m W	Unspecified Disused Levels	1964	311565
C	375m S	Railway Building	1948	256653
V	395m W	Unspecified Quarry	1948	278173
V	396m W	Unspecified Quarry	1921	294498
V	399m W	Unspecified Quarry	1913	281388
V	399m W	Unspecified Quarry	1913	281388
V	400m W	Unspecified Quarry	1913	287041
V	400m W	Unspecified Quarry	1897	283785
W	400m E	Railway Building	1921	312979
W	400m E	Railway Building	1913	312979
X	401m W	Refuse Heap	1921	313531
X	403m W	Refuse Heap	1948	313531
V	403m W	Unspecified Quarry	1948	280683
X	404m W	Refuse Heap	1913	310187
X	404m W	Refuse Heap	1948	314957
X	404m W	Refuse Heap	1948	314957
Q	405m SE	Unspecified Disused Mine	1965	285747
Q	405m SE	Unspecified Disused Mine	1980	285747
Q	405m SE	Unspecified Disused Mine	1983	285747
4	409m NE	Unspecified Heap	1983	260073
O	411m SE	Unspecified Ground Workings	1913	309005
O	412m SE	Unspecified Heap	1948	299662
O	412m SE	Unspecified Ground Workings	1921	289971
O	413m SE	Unspecified Ground Workings	1913	303391
O	413m SE	Unspecified Ground Workings	1913	303391
Z	414m N	Unspecified Disused Levels	1983	250786
Q	415m SE	Unspecified Ground Workings	1913	300267
O	416m SE	Unspecified Heap	1948	316796



ID	Location	Land Use	Date	Group ID
O	416m SE	Unspecified Heap	1948	316796
O	417m SE	Unspecified Heap	1965	316796
O	417m SE	Unspecified Heap	1980	316796
O	417m SE	Unspecified Heap	1983	316796
Q	417m SE	Unspecified Ground Workings	1921	300267
Z	423m N	Old Coal Level	1948	305085
Z	424m N	Old Coal Level	1913	285669
Z	424m N	Old Coal Level	1897	285669
Z	425m N	Old Coal Level	1948	281238
Z	425m N	Old Coal Level	1948	281238
Z	425m N	Old Coal Level	1913	281238
Z	425m N	Old Coal Level	1913	281238
Z	429m N	Old Coal Level	1921	281238
Z	432m N	Coal Level	1913	302687
Z	432m N	Coal Level	1897	292828
Z	432m N	Coal Level	1948	279406
Z	432m N	Coal Level	1948	279406
Z	433m N	Coal Level	1948	279406
Z	433m N	Coal Level	1913	306449
Z	433m N	Coal Level	1913	306449
Z	438m N	Coal Level	1921	306449
AA	450m E	Unspecified Heap	1948	297792
AA	451m E	Unspecified Heaps	1913	273953
AA	451m E	Unspecified Heaps	1913	273953
Z	452m N	Unspecified Disused Levels	1983	250788
AA	453m E	Unspecified Heap	1913	316625
AA	453m E	Unspecified Heaps	1948	289662
AA	453m E	Unspecified Heaps	1948	289662

ID	Location	Land Use	Date	Group ID
AA	455m E	Unspecified Heap	1921	316625
AA	461m E	Unspecified Heaps	1965	290608
AA	461m E	Unspecified Heaps	1980	290608
AA	461m E	Unspecified Heaps	1983	290608
5	491m E	Unspecified Pit	1983	268462
R	497m N	Coal Level	1948	270707
R	499m N	Coal Level	1948	270716
R	500m N	Unspecified Old Quarries	1913	304618

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

11

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 23**

ID	Location	Land Use	Date	Group ID
F	92m N	Tank or Trough	1877	34509
F	100m N	Tank or Trough	1877	34507
H	210m E	Tanks	1960	34863
H	213m E	Tanks	1918	34862
H	239m E	Tanks	1918	34861
Y	402m SW	Unspecified Tank	1993	35326
Q	402m SE	Unspecified Tank	1993	36235
Y	403m SW	Unspecified Tank	1960	35363
Y	403m SW	Unspecified Tank	1971	35363
Q	404m SE	Unspecified Tank	1960	36235
Q	404m SE	Unspecified Tank	1971	36235

This data is sourced from Ordnance Survey / Groundsure.



2.3 Historical energy features

Records within 500m

2

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 23**

ID	Location	Land Use	Date	Group ID
A	20m NW	Electricity Substation	1993	18649
A	24m NW	Electricity Substation	1971	18692

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m

2

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

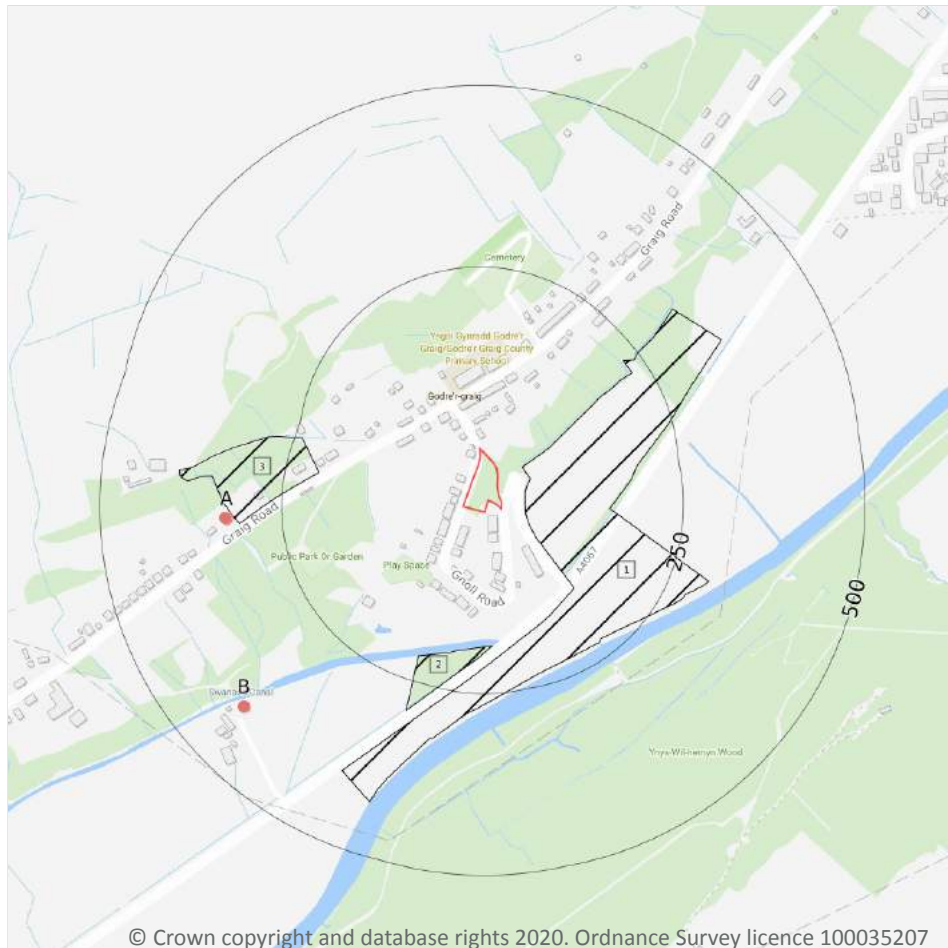
Features are displayed on the Past land use - un-grouped map on **page 23**

ID	Location	Land Use	Date	Group ID
D	66m SE	Garage	1993	6526
D	68m SE	Garage	1971	6526

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical landfill (EA/NRW)
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.



3.3 Historical landfill (LA/mapping records)

Records within 500m

0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m

3

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

Features are displayed on the Waste and landfill map on **page 34**

ID	Location	Details		
1	32m E	Site Address: Tip off A4067 at Godre r-graig Licence Holder Address: -	Waste Licence: - Site Reference: - Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded: - Last Recorded: -
2	184m S	Site Address: Disused Tip of A4067 Licence Holder Address: -	Waste Licence: - Site Reference: - Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded: - Last Recorded: -
3	204m W	Site Address: Cilmaengwyn Waste Tip Licence Holder Address: -	Waste Licence: - Site Reference: - Waste Type: - Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: - Licence Holder: - First Recorded: - Last Recorded: -

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m

0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m

0

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m

4

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

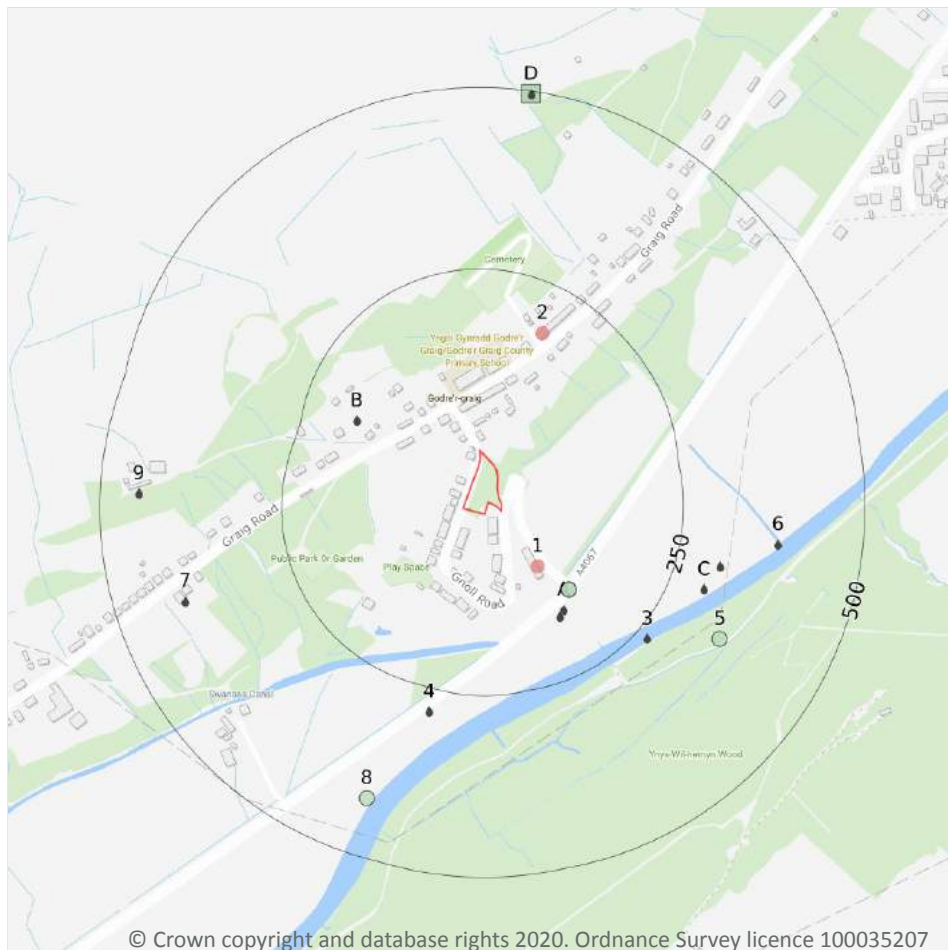
Features are displayed on the Waste and landfill map on **page 34**

ID	Location	Site	Reference	Category	Sub-Category	Description
A	326m W	279 Graig Road Godrergrraig Abertawe SA92NZ	NRW- WME019305	Using waste exemption	Waste Exemption - Agricultural and Non- Agricultural	Use of waste in construction
A	328m W	258 Graig Road, Godrergrraig, Swansea, Castell-nedd Port Talbot, SA9 2NZ	NRW- WME040049	Using waste exemption	Not on a farm	Use of waste in construction
B	409m SW	DCWW, Cwm Tawe Isaf, Godrergrraig, Swansea, Castell-nedd Port Talbot, SA9 2PD	NRW- WME039450	Storing waste exemption	Not on a farm	Storage of sludge
B	409m SW	DCWW, Cwm Tawe Isaf, Godrergrraig, Swansea, Castell-nedd Port Talbot, SA92PD	NRW- WME033660	Storing waste exemption	Not on a farm	Storage of sludge

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- Licensed Discharges to controlled waters
- List 2 Dangerous Substances
- Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m

2

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 37**

ID	Location	Company	Address	Activity	Category
1	91m SE	Swansea Valley Exhaust & Tyre Centre Ltd	Gnoll Road, Godrergraig, Swansea, West Glamorgan, SA9 2PA	Vehicle Repair, Testing and Servicing	Repair and Servicing
2	184m NE	Sunnyvale	147, Graig Road, Godrergraig, Swansea, West Glamorgan, SA9 2NY	General Construction Supplies	Industrial Products

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m

0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m

0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m

0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m

0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m

0

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m

0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m

0

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m

0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m

0

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m

0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m

13

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on **page 37**

ID	Location	Address	Details	
A	160m SE	Cso Godre'R Graig Soc 20. Godre'R, A4067 Opp Gnoll Road, Godrergrraig, Swansea, SA9 2PA	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: BW2302801 Permit Version: 0 Receiving Water: River Tawe	Status: Effective Issue date: 24/10/2019 Effective Date: 24/10/2019 Revocation Date: -
A	166m SE	SWO. GODRE'R GRAIG SOC 20. GODRE'R, GODRE'R GRAIG, YSTALYFERA, NEATH PORT TALBOT	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: BW2302801 Permit Version: 3 Receiving Water: RIVER TAWE	Status: Effective Issue date: 24/08/2005 Effective Date: 24/08/2015 Revocation Date: -
B	174m W	191 GRAIG RD GODRERGRAIG YSTALYFERA, 191 GRAIG RD GODRERGRAIG YSTALYF, GODRERGRAIG YSTALYFERA SWANSEA, YSTALYFERA SWANSEA, SWANSEA	Effluent Type: UNSPECIFIED Permit Number: BF0102701 Permit Version: 1 Receiving Water: TO LAND NR SWANSEA CANAL	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 12/12/1973 Effective Date: 12/12/1973 Revocation Date: -
B	174m W	191 GRAIG RD GODRERGRAIG YSTALYFERA, 191 GRAIG RD GODRERGRAIG YSTALYF, GODRERGRAIG YSTALYFERA SWANSEA, YSTALYFERA SWANSEA, SWANSEA	Effluent Type: UNSPECIFIED Permit Number: BF0102701 Permit Version: 1 Receiving Water: TO LAND NR SWANSEA CANAL	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 12/12/1973 Effective Date: 12/12/1973 Revocation Date: -
3	266m SE	PONTARDAWE TARENI SITE GODRE-GRAIG, PONTARDAWE TARENI SITE GODRE-GRAIG, TARENI SITE GODRE-GRAIG SWANSEA, GODRE-GRAIG SWANSEA W GLAM, SWANSEA W GLAM, W GLAM	Effluent Type: UNSPECIFIED Permit Number: BP0009901 Permit Version: 1 Receiving Water: RIVER TAWE	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 07/02/1986 Effective Date: 07/02/1986 Revocation Date: 29/09/1992



ID	Location	Address	Details	
4	282m S	CWMTAWE ISAF GODREGRAIG SWANSEA, GODREGRAIG SWANSEA, SWANSEA	Effluent Type: UNSPECIFIED Permit Number: BC0021801 Permit Version: 1 Receiving Water: CATCH PIT TO R/BANK SWANSEA VA	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 23/12/1964 Effective Date: 23/12/1964 Revocation Date: 08/02/1994
C	298m E	SWO. GODRE'R GRAIG SOC 20. GODRE'R, GODRE'R GRAIG, YSTALYFERA, NEATH PORT TALBOT	Effluent Type: UNSPECIFIED Permit Number: BW2302801 Permit Version: 1 Receiving Water: RIVER TAWE	Status: NEW CONSENT, BY APPLICATION (WRA 91, SECTION 88) Issue date: 20/10/1989 Effective Date: 20/10/1989 Revocation Date: 30/03/2008
C	298m E	Swo. Godre'R Graig Soc 20. Godre'R, Godre'R Graig, Ystalyfera, Neath Port Talbot	Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: BP0343701 Permit Version: 0 Receiving Water: River Tawe	Status: Surrendered Issue date: 07/03/2005 Effective Date: 31/03/2008 Revocation Date: -
C	310m E	PONTARDAWE TARENI SITE GODRE- GRAIG., PONTARDAWE TARENI SITE GODRE-GRA, TARENI SITE GODRE- GRAIG. SWANSEA, GODRE-GRAIG. SWANSEA W GLAM	Effluent Type: UNSPECIFIED Permit Number: BP0009902 Permit Version: 1 Receiving Water: RIVER TAWE	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 07/02/1986 Effective Date: 13/02/1986 Revocation Date: 29/09/1992
6	383m E	SWANSEA TARENI SITE AREA B, TARENI SITE AREA B	Effluent Type: UNSPECIFIED Permit Number: BP0025201 Permit Version: 1 Receiving Water: RIVER TAWE	Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY Issue date: 07/10/1986 Effective Date: 07/10/1986 Revocation Date: 07/02/1986
7	403m W	258 Graig Road, Godrergrraig, Swansea, SA9 2NZ	Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: AB3897CA Permit Version: 0 Receiving Water: groundwater via infiltration system	Status: Effective Issue date: 22/06/2018 Effective Date: 22/06/2018 Revocation Date: -
9	447m W	PENTWYN FARM GODRER GRAIG SWANSEA V, PENTWYN FARM GODRER GRAIG SWANSE, GODRER GRAIG SWANSEA VALLEY., SWANSEA VALLEY.	Effluent Type: UNSPECIFIED Permit Number: BP0136501 Permit Version: 1 Receiving Water: TO LAND	Status: CONSENT EXPIRED - TIME LIMIT Issue date: 14/04/1989 Effective Date: 14/04/1989 Revocation Date: 16/09/1994
D	496m N	Pentwyn (No 3) Colliery Graig Road, Pentwyn (No 3) Colliery Graig Ro, Graig Road Godre Graig Ystalyfer, Godre Graig Ystalyfera, Ystalyfera	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: BP0071101 Permit Version: 0 Receiving Water: RIVER TAWE TRIBUTARY	Status: Effective Issue date: 26/10/1992 Effective Date: 26/01/1993 Revocation Date: -



This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0
---------------------	---

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0
---------------------	---

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0
---------------------	---

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	1
---------------------	---

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 37**

ID	Location	Name	Status	Receiving Water	Authorised Substances
D	496m N	Pentwyn Colliery (no 3)	Active	None	Iron

This data is sourced from the Environment Agency and Natural Resources Wales.



4.18 Pollution Incidents (EA/NRW)

Records within 500m

4

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 37**

ID	Location	Details	
A	142m SE	Incident Date: 10/08/2016 Incident Identification: 1700077 Pollutant: Oils and Fuels Pollutant Description: Diesel	Water Impact: No Details Land Impact: Category 4 (No Impact) Air Impact: No Details
A	142m SE	Incident Date: 10/08/2016 Incident Identification: 1700077 Pollutant: - Pollutant Description: -	Water Impact: No Details Land Impact: Category 4 (No Impact) Air Impact: No Details
5	348m SE	Incident Date: 03/09/2003 Incident Identification: 187245 Pollutant: Specific Waste Materials Pollutant Description: Other Specific Waste Material	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
8	420m S	Incident Date: 17/10/2014 Incident Identification: 1287703 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: - Land Impact: Category 3 (Minor) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m

0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



4.20 Pollution inventory waste transfers

Records within 500m

0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m

0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



[illegible]

-  Principal
-  Secondary A
-  Secondary B
-  Secondary Undifferentiated
-  Unproductive
-  Unknown

Records within 500m	3
---------------------	---

Features are displayed on the Hydrogeology map on **page 45**

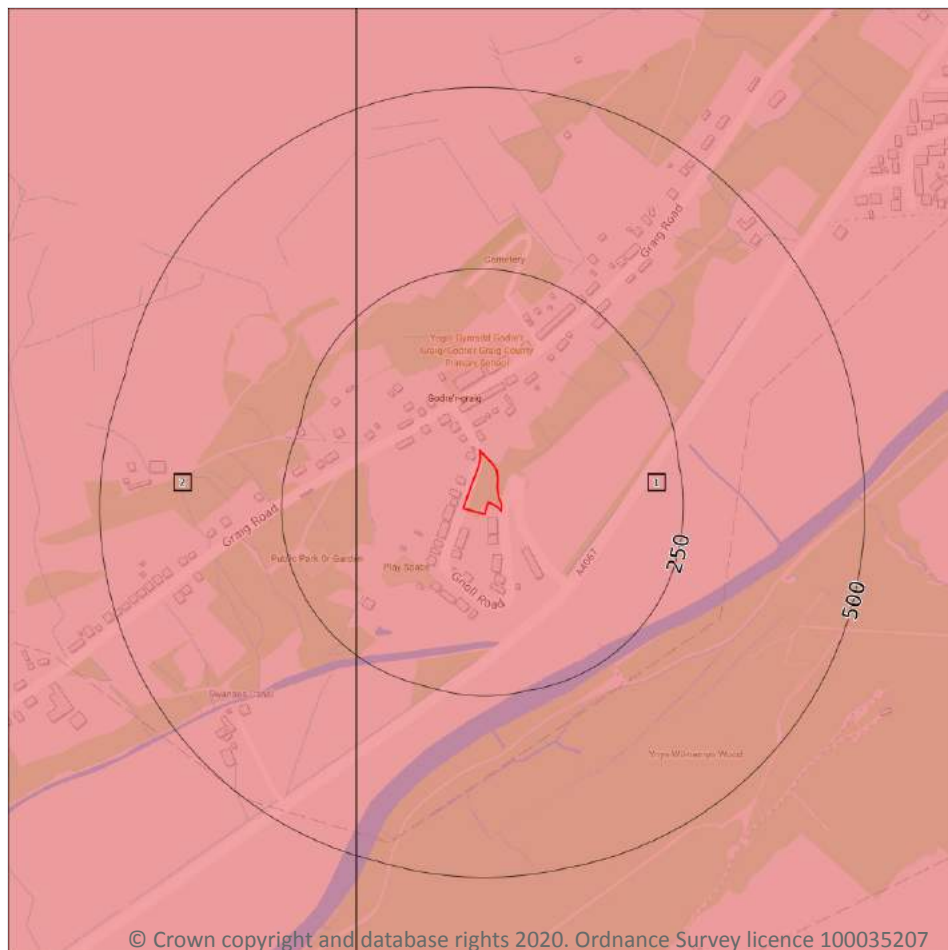
ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	147m W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

ID	Location	Designation	Description
3	241m NW	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



— Site Outline

Search buffers in metres (m)

 Principal

Secondary A

Secondary B

Secondary Undifferentiated

Unproductive

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5.2 Bedrock aquifer

Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

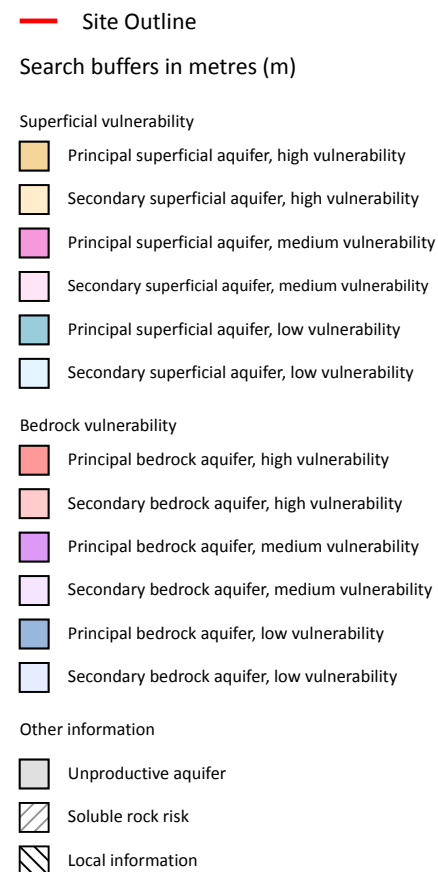
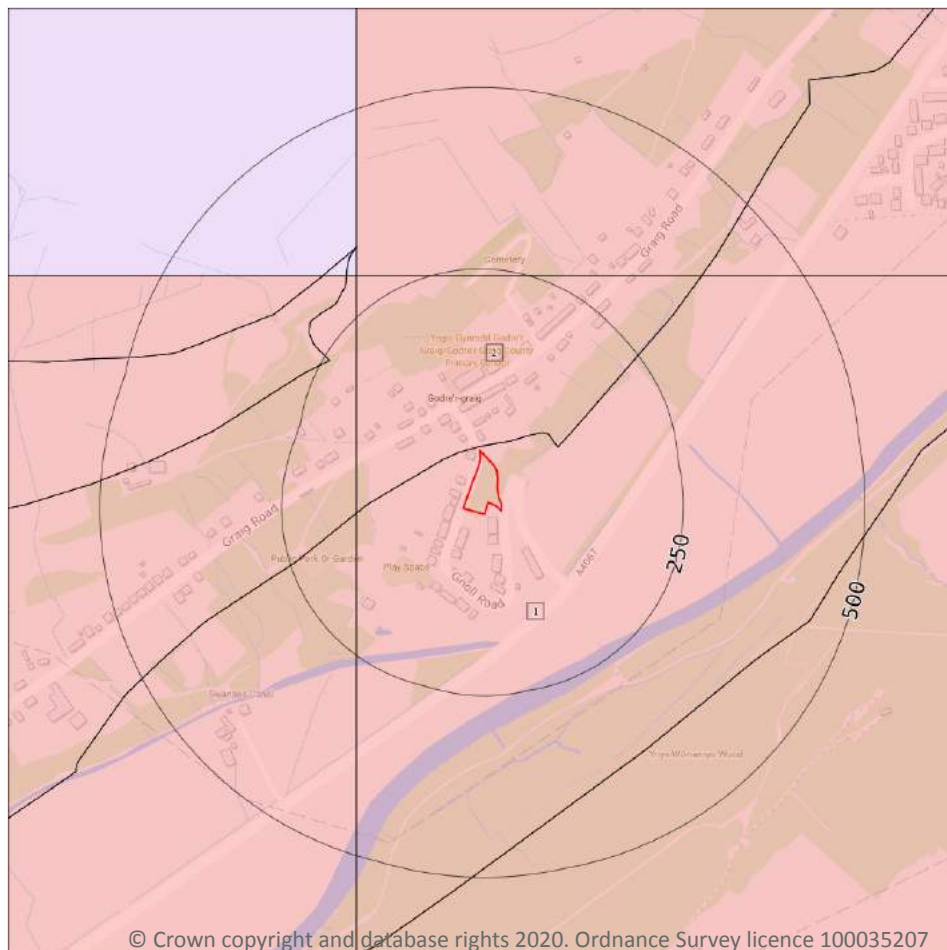
Features are displayed on the Bedrock aquifer map on **page 47**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	147m W	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

2

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 49**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: >550mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: <3m Patchiness value: <90% Recharge potential: High	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures
2	5m N	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: High Infiltration value: 40-70% Dilution value: >550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: High	Vulnerability: High Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site

0

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

Records on site

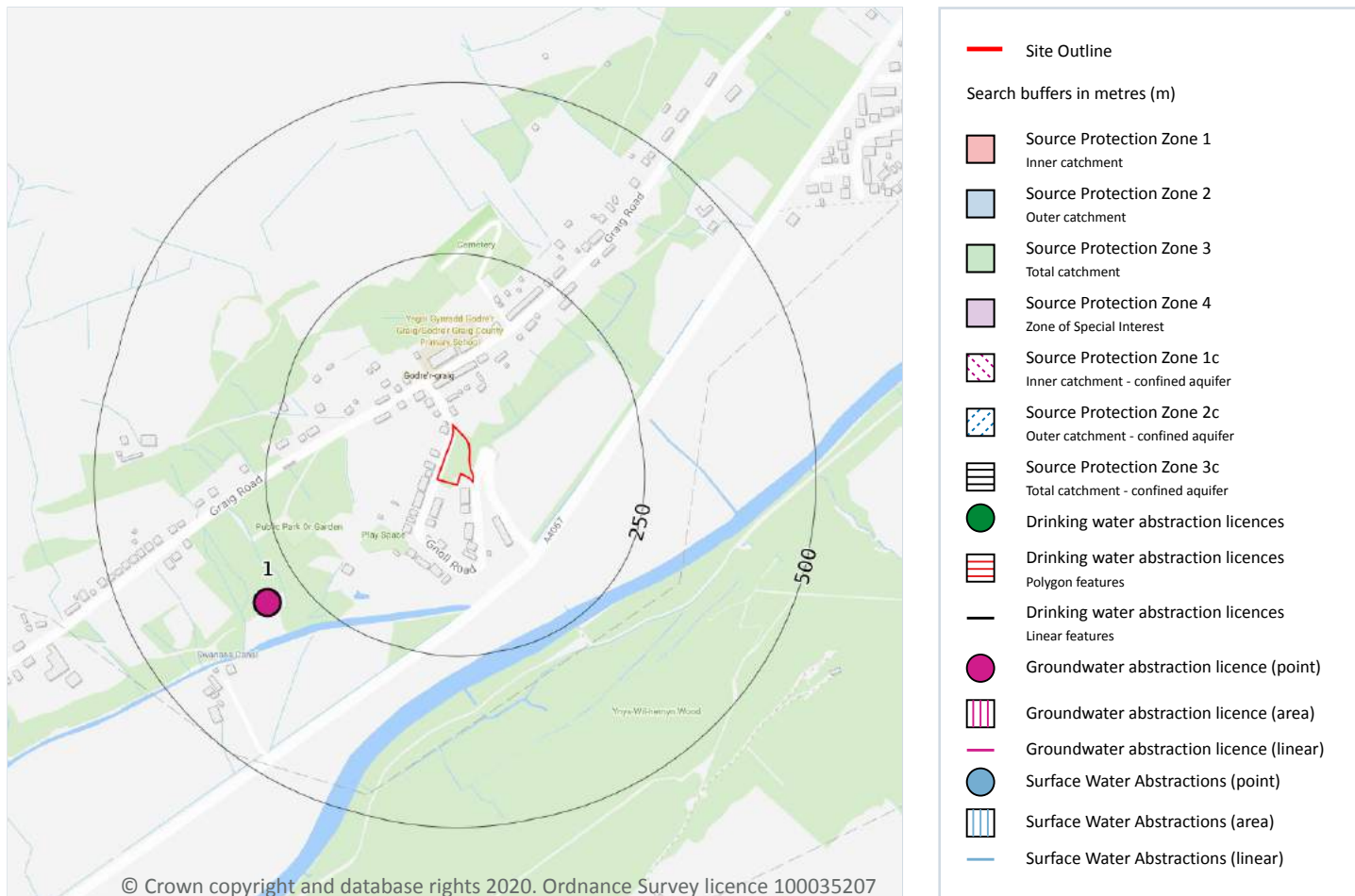
0

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk.

This data is sourced from the British Geological Survey and the Environment Agency.



Abstractions and Source Protection Zones



5.6 Groundwater abstractions

Records within 2000m

1

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 51**

ID	Location	Details	
1	305m SW	Status: Historical Licence No: 22/59/1/0022 Details: General Farming & Domestic Direct Source: EAW Groundwater Point: SPRING AT CWMTAWE ISAF Data Type: Point Name: Morris Easting: 274900 Northing: 206500	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 31/01/1966 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m

3

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 51**

ID	Location	Details	
-	1582m NW	Status: Historical Licence No: 22/59/1/0117 Details: Dust Suppression Direct Source: EAW Surface Water Point: INLAND WATER KNOWN AS CWM DU RIVER Data Type: Point Name: Aggregate Industries UK Ltd Easting: 273830 Northing: 207600	Annual Volume (m ³): 20000 Max Daily Volume (m ³): 88 Original Application No: - Original Start Date: 06/07/1996 Expiry Date: 31/08/2017 Issue No: 101 Version Start Date: 20/05/2013 Version End Date: -
-	1589m NW	Status: Active Licence No: WA/059/0001/0024 Details: Dust Suppression - High Direct Source: Cwm Du Point: - Data Type: Point Name: - Easting: 273823 Northing: 207602	Annual Volume (m ³): 20,000 Max Daily Volume (m ³): 192 Original Application No: - Original Start Date: Sep 1 2017 12:00AM Expiry Date: Mar 31 2029 12:00AM Issue No: - Version Start Date: - Version End Date: -



ID	Location	Details	
-	1698m NE	Status: Historical Licence No: 22/59/1/0107 Details: Effluent/Slurry Dilution Direct Source: EAW Surface Water Point: SWANSEA CANAL SWANSEA VALLEY Data Type: Point Name: British Waterways Board Easting: 276250 Northing: 208070	Annual Volume (m ³): - Max Daily Volume (m ³): - Original Application No: - Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 11/08/1992 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	0
-----------------------------	----------

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	0
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Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

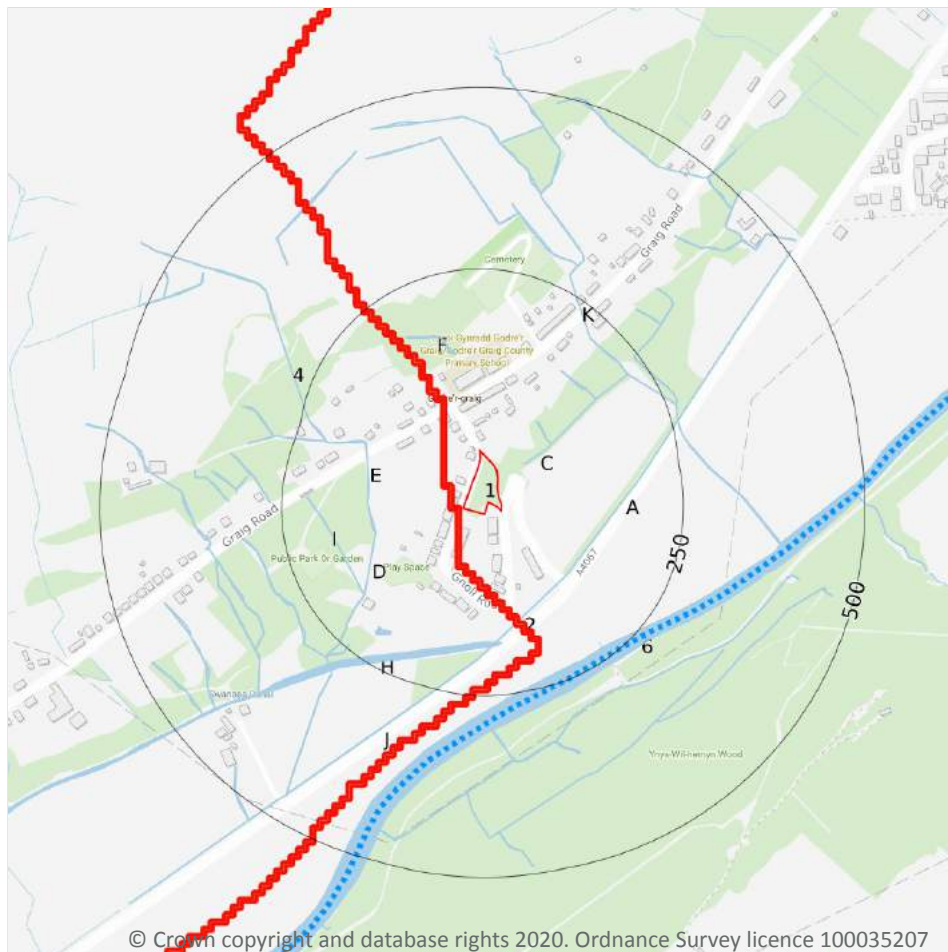
5.10 Source Protection Zones (confined aquifer)

Records within 500m	0
----------------------------	----------

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



-  Site Outline
- Search buffers in metres (m)
-  Water Network (OS MasterMap)
-  Surface water features (wider than 5m)
-  Surface water features (narrower than 5m)
-  WFD River, canal and surface water transfer water bodies
-  WFD Lake water bodies
-  WFD Transitional and coastal water bodies
-  WFD Surface water body catchments boundaries
-  WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

31

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 54**

ID	Location	Type of water feature	Ground level	Permanence	Name
C	39m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

ID	Location	Type of water feature	Ground level	Permanence	Name
C	80m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	80m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	83m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	124m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	125m W	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
E	125m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
2	125m SE	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
F	136m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	156m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	165m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	168m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	176m SW	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
H	179m S	Canal. A manmade watercourse for inland navigation.	On ground surface	Watercourse contains water year round (in normal circumstances)	Swansea Canal



ID	Location	Type of water feature	Ground level	Permanence	Name
H	181m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
I	185m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
I	186m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	199m S	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	209m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
E	209m W	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	216m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
K	216m NE	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-
C	217m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	222m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	222m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	223m NE	Marsh. An area that is predominantly waterlogged by freshwater.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
4	238m W	Inland river not influenced by normal tidal action.	Not provided	Watercourse contains water year round (in normal circumstances)	-



ID	Location	Type of water feature	Ground level	Permanence	Name
H	243m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	243m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	243m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
6	246m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Afon Tawe

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

19

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 54**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site

1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 54**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
A	On site	River WB catchment	Tawe -confluence with Twrch to tidal limit	GB110059032180	Tawe	Tawe to Cadoxton

This data is sourced from the Environment Agency and Natural Resources Wales.



6.4 WFD Surface water bodies

Records identified

1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site.

Features are displayed on the Hydrology map on **page 54**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
5	246m SE	River	Tawe -confluence with Twrch to tidal limit	GB110059032180	Moderate	Fail	Good	2016

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site

1

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place.

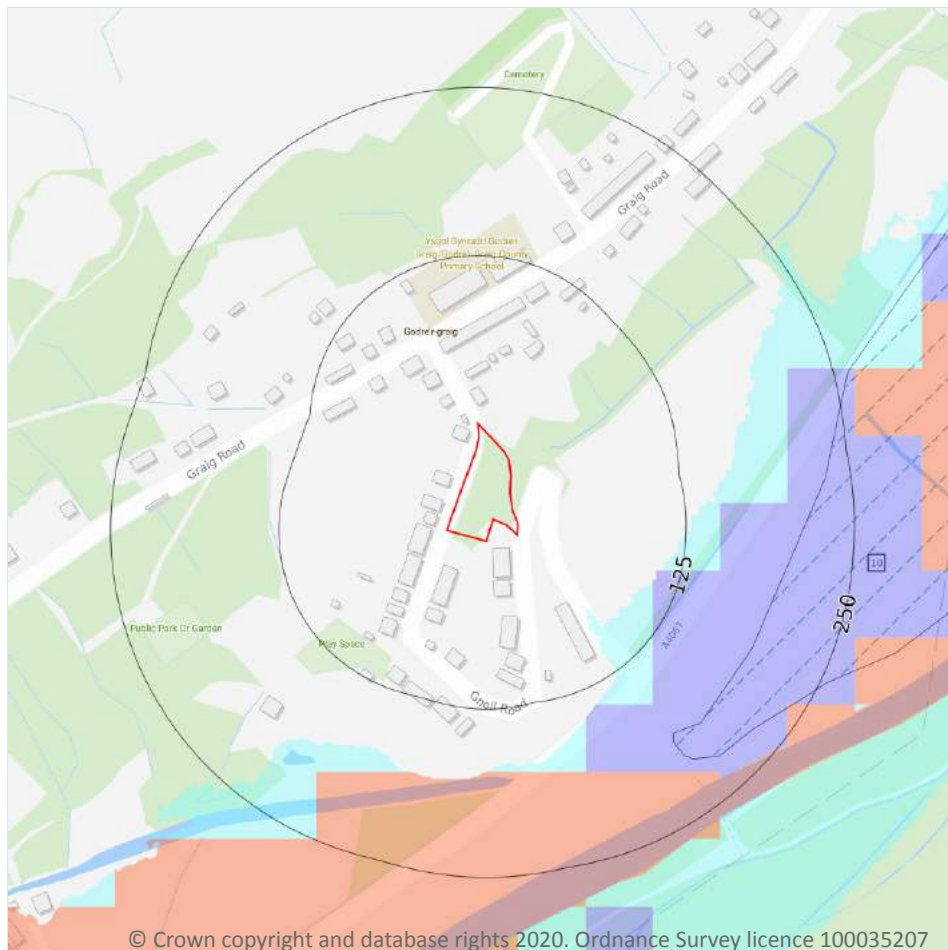
Features are displayed on the Hydrology map on **page 54**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
1	On site	Swansea Carboniferous Coal Measures	GB41002G201000	Poor	Poor	Good	2016

This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding



- Site Outline
- Search buffers in metres (m)
- Environment Agency river and coastal flooding:
 - High
 - Medium
 - Low
 - Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

7.1 Risk of Flooding from Rivers and Sea (RoFRaS)

Records within 50m

0

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m

1

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

Features are displayed on the River and coastal flooding map on **page 59**

ID	Location	Event name	Date of flood	Flood source	Flood cause	Type of flood
10	187m SE	Tawe 1979	1979-12-27 1979-12-27	Main river	Channel capacity exceeded (no raised defences)	Fluvial

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m

0

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m	0
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Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m	0
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Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding

8.1 Surface water flooding

Highest risk on site

Negligible

Highest risk within 50m

Negligible

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

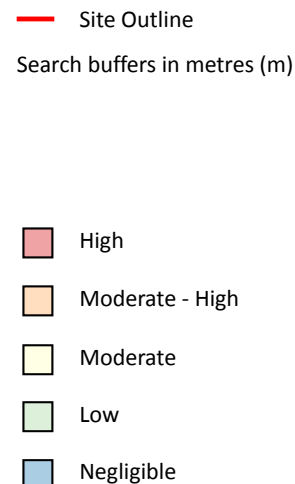
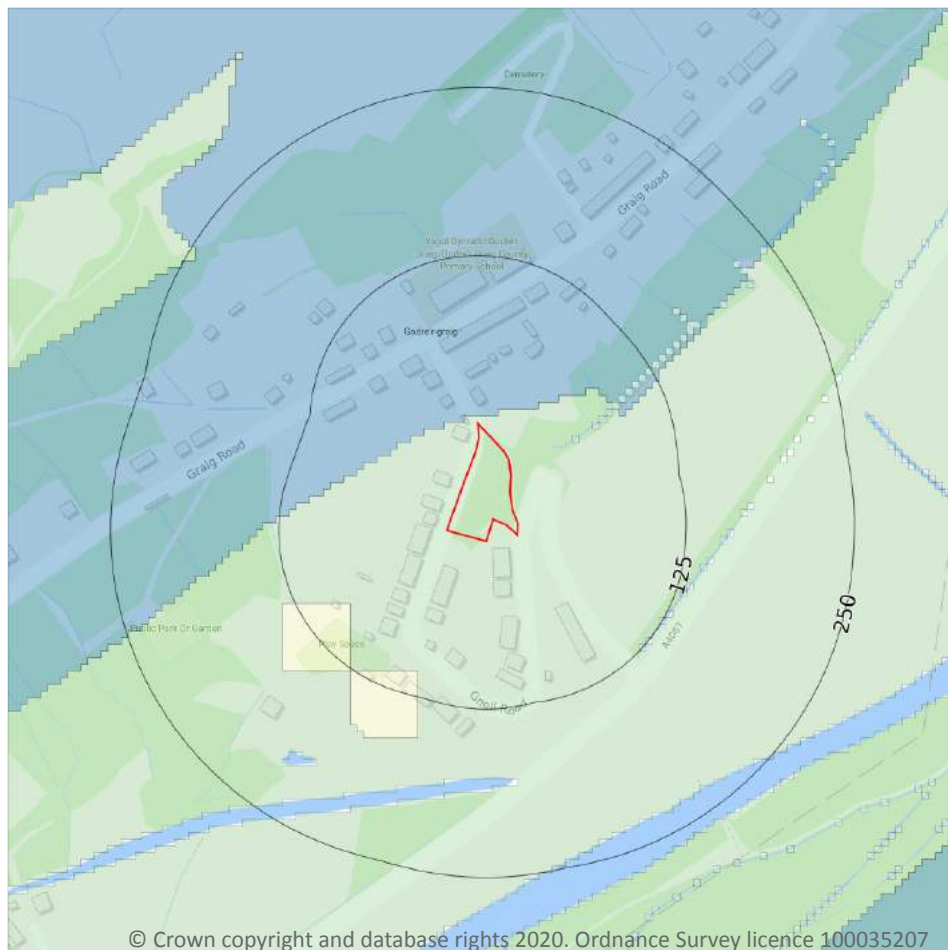
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site. The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiental Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Low

Highest risk within 50m

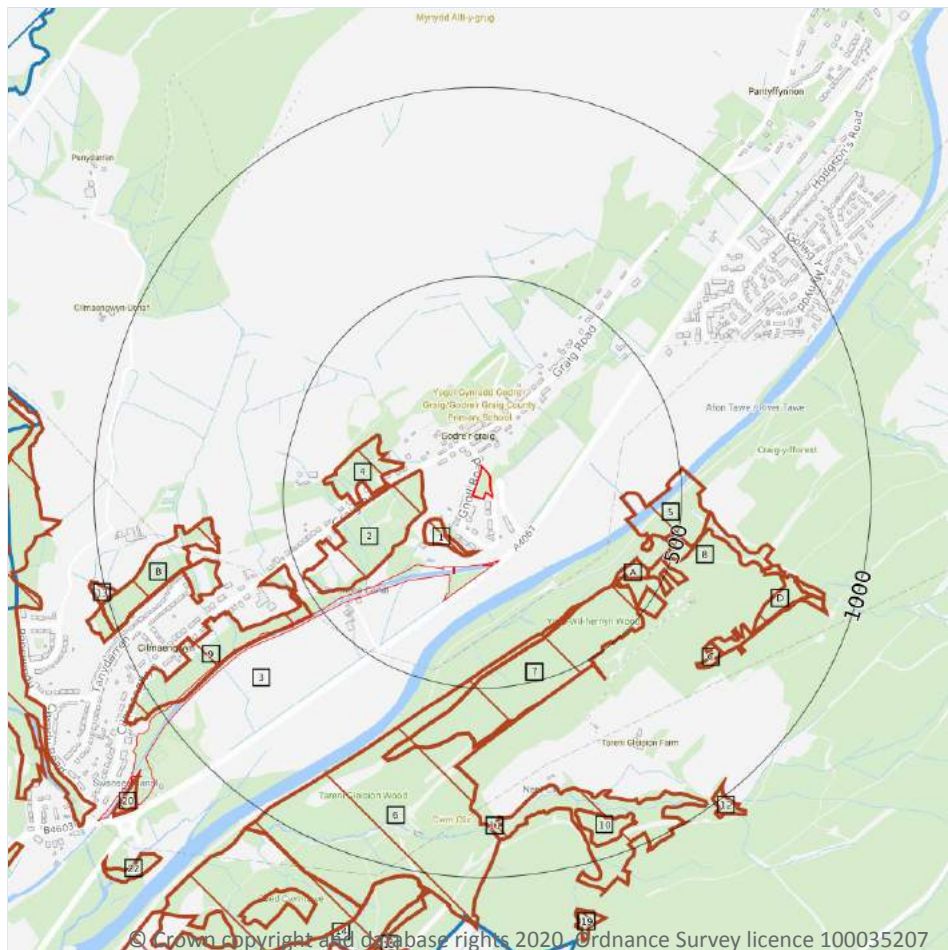
Low

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 63**

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- + Local Nature Reserves (LNR)
- / Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

5

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 64**

ID	Location	Name	Data source
18	1104m S	Cilybebyll	Natural Resources Wales



ID	Location	Name	Data source
E	1158m W	Coed Cwm Du, Cilmaengwyn	Natural Resources Wales
21	1236m S	Cilybebyll	Natural Resources Wales
-	1399m S	Cilybebyll	Natural Resources Wales
30	1558m NW	Gwrhyd Meadows	Natural Resources Wales

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0
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Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0
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Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0
-----------------------------	----------

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m

0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m

1

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on **page 64**

ID	Location	Name	Data source
3	168m S	SWANSEA CANAL	Natural Resources Wales

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

50

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on **page 64**

ID	Location	Name	Woodland Type
1	105m SW	Unknown	Restored Ancient Woodland Site
2	127m W	Unknown	Restored Ancient Woodland Site
4	199m W	Unknown	Restored Ancient Woodland Site
5	341m E	Unknown	Ancient Semi Natural Woodland
6	359m SE	Unknown	Restored Ancient Woodland Site
7	367m SE	Unknown	Restored Ancient Woodland Site



ID	Location	Name	Woodland Type
A	389m SE	Unknown	Ancient Semi Natural Woodland
8	455m SE	Unknown	Ancient Semi Natural Woodland
A	474m SE	Unknown	Ancient Semi Natural Woodland
9	524m SW	Unknown	Restored Ancient Woodland Site
B	681m W	Unknown	Restored Ancient Woodland Site
C	687m SE	Unknown	Plantation on Ancient Woodland Site
C	692m SE	Unknown	Ancient Woodland Site of Unknown Category
B	694m W	Unknown	Restored Ancient Woodland Site
D	745m E	Unknown	Ancient Woodland Site of Unknown Category
10	776m S	Unknown	Ancient Semi Natural Woodland
D	831m E	Unknown	Ancient Semi Natural Woodland
D	855m E	Unknown	Ancient Woodland Site of Unknown Category
11	863m S	Unknown	Restored Ancient Woodland Site
12	972m SE	Unknown	Ancient Semi Natural Woodland
13	972m W	Unknown	Ancient Semi Natural Woodland
14	1016m S	Unknown	Ancient Semi Natural Woodland
15	1025m S	Unknown	Ancient Semi Natural Woodland
16	1046m SW	Unknown	Ancient Semi Natural Woodland
17	1092m W	Unknown	Ancient Semi Natural Woodland
19	1112m S	Unknown	Ancient Semi Natural Woodland
20	1151m SW	Unknown	Ancient Semi Natural Woodland
E	1176m W	Unknown	Ancient Semi Natural Woodland
22	1263m SW	Unknown	Ancient Semi Natural Woodland
-	1478m W	Unknown	Ancient Semi Natural Woodland
25	1508m SW	Unknown	Ancient Semi Natural Woodland
-	1516m SW	Unknown	Restored Ancient Woodland Site
-	1522m NW	Unknown	Ancient Semi Natural Woodland
-	1528m NW	Unknown	Ancient Semi Natural Woodland



ID	Location	Name	Woodland Type
-	1546m SW	Unknown	Ancient Semi Natural Woodland
-	1564m S	Unknown	Restored Ancient Woodland Site
-	1600m NE	Unknown	Ancient Semi Natural Woodland
-	1611m W	Unknown	Ancient Semi Natural Woodland
-	1655m W	Unknown	Ancient Semi Natural Woodland
-	1670m N	Unknown	Plantation on Ancient Woodland Site
-	1695m SW	Unknown	Ancient Semi Natural Woodland
-	1719m SW	Unknown	Restored Ancient Woodland Site
-	1730m SW	Unknown	Restored Ancient Woodland Site
-	1798m S	Unknown	Ancient Semi Natural Woodland
-	1811m SW	Unknown	Ancient Semi Natural Woodland
-	1873m W	Unknown	Ancient Semi Natural Woodland
-	1933m S	Unknown	Plantation on Ancient Woodland Site
-	1939m NW	Unknown	Ancient Semi Natural Woodland
-	1976m S	Unknown	Restored Ancient Woodland Site
-	1992m SW	Unknown	Ancient Semi Natural Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.



10.9 Forest Parks

Records within 2000m

0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

0

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.



10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

0

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units

10.17 SSSI Impact Risk Zones

Records on site

0

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m

0

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

This data is sourced from Natural England and Natural Resources Wales.



11 Visual and cultural designations

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

0

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.



This data is sourced from English Heritage, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m

0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from English Heritage, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m

0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from English Heritage, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m

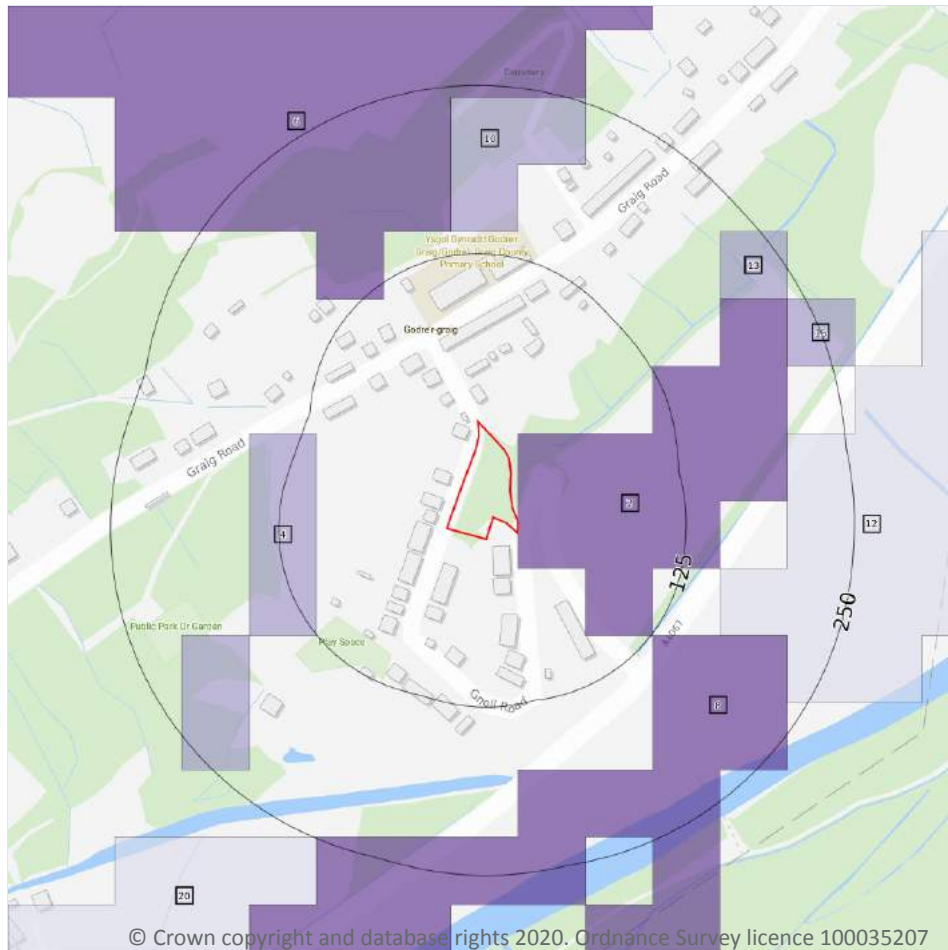
0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from English Heritage, Cadw and Historic Environment Scotland.



12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Timber felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m

10

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 74**

ID	Location	Classification	Description
2	0m E	Grade 5	Very poor quality agricultural land
4	97m W	Grade 4	Poor quality agricultural land
6	115m NW	Grade 5	Very poor quality agricultural land

ID	Location	Classification	Description
8	126m SE	Grade 5	Very poor quality agricultural land
10	141m N	Grade 4	Poor quality agricultural land
12	153m E	Grade 3b	Moderate quality agricultural land
A	167m SW	Grade 4	Poor quality agricultural land
13	196m NE	Grade 4	Poor quality agricultural land
15	218m E	Grade 4	Poor quality agricultural land
20	249m SW	Grade 3b	Moderate quality agricultural land

This data is sourced from Natural Resources Wales.

12.2 Open Access Land

Records within 250m

0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m

0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment.

This data is sourced from Natural England.



12.5 Countryside Stewardship Schemes

Records within 250m

0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.



13 Habitat designations

13.1 Priority Habitat Inventory

Records within 250m**0**

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m**0**

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m**0**

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

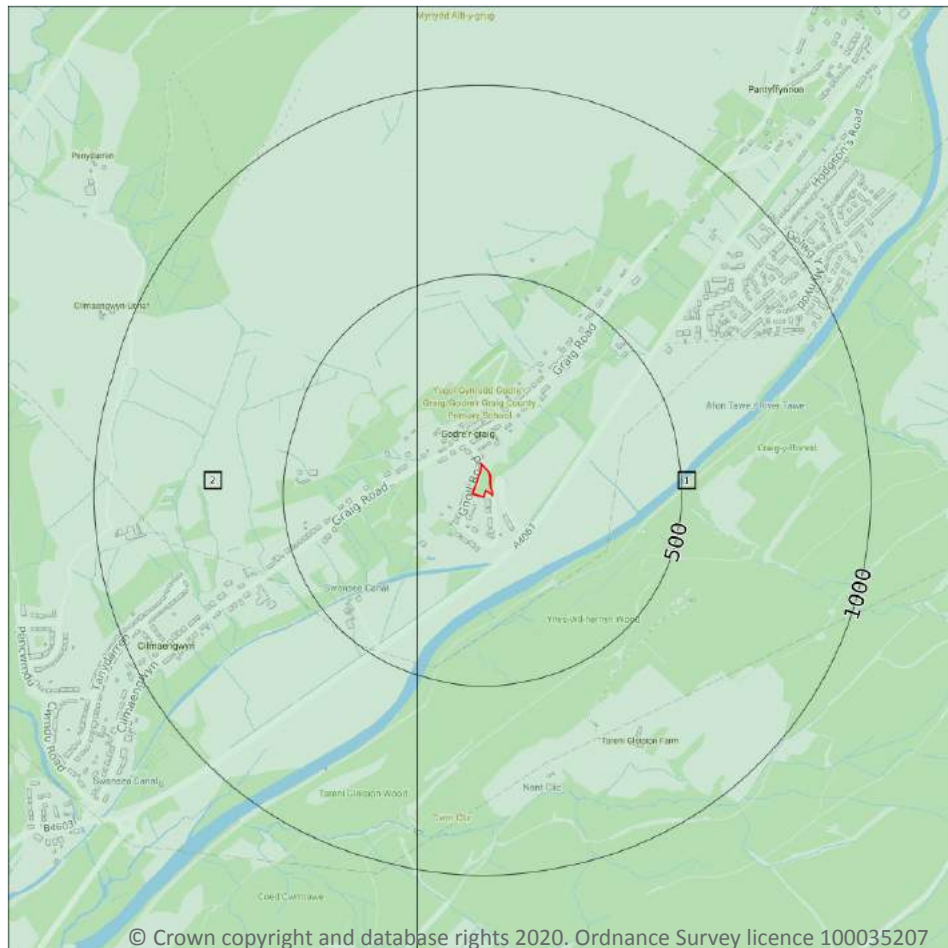
Records within 250m**0**

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

14.1 10k Availability

Records within 500m

2

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

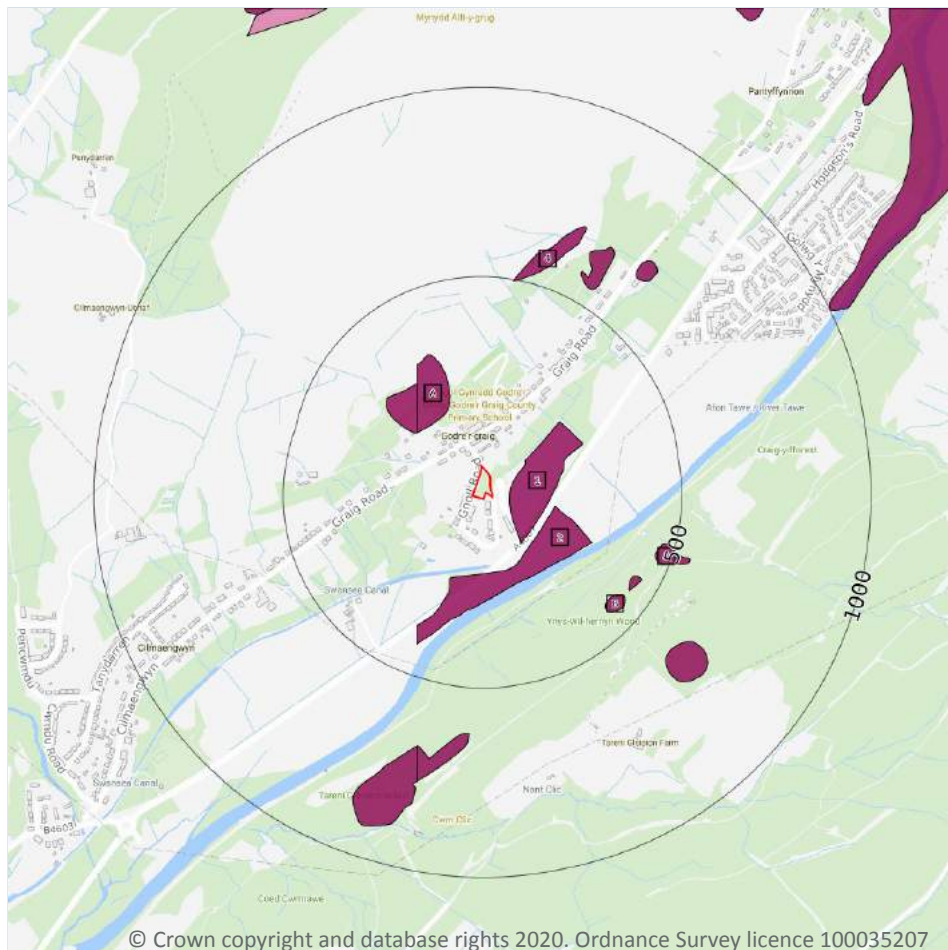
Features are displayed on the Geology 1:10,000 scale - Availability map on **page 78**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	SN70NE
2	147m W	Full	Full	Full	Full	SN70NW

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground



— Site Outline
Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m

8

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 79**

ID	Location	LEX Code	Description	Rock description
1	46m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	154m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	166m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	191m NW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

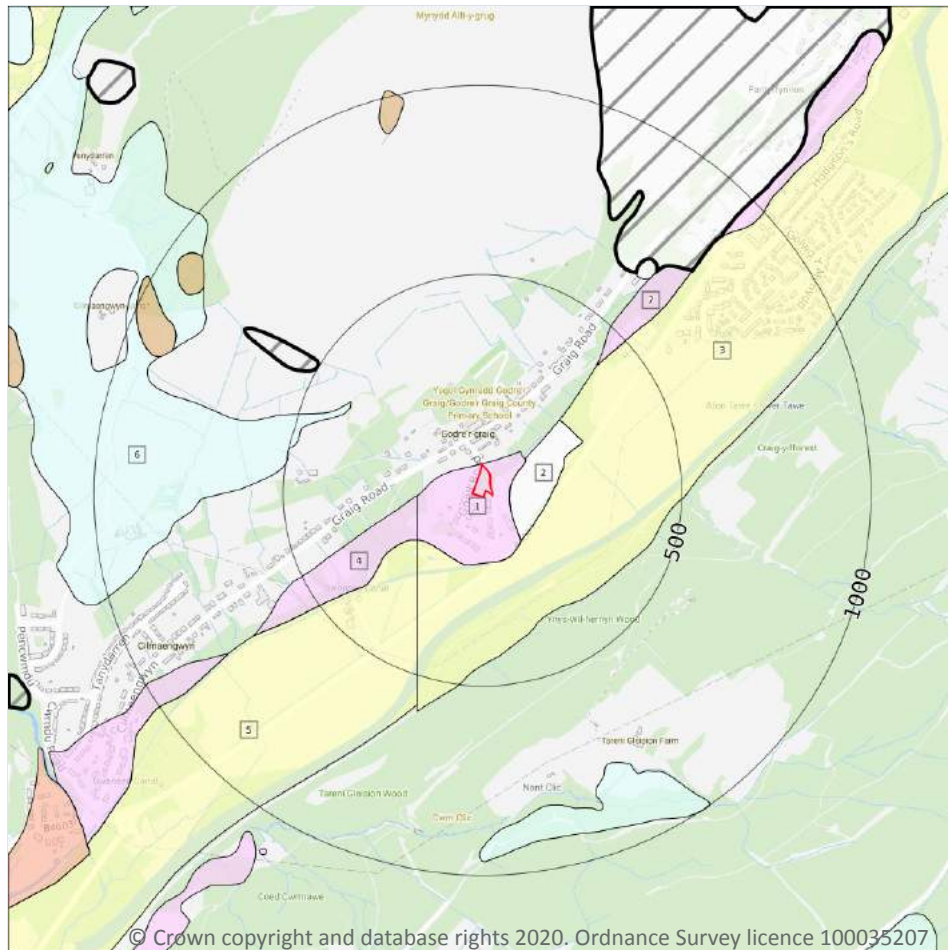


ID	Location	LEX Code	Description	Rock description
B	408m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
B	425m SE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
3	457m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	497m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

7

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 81**

ID	Location	LEX Code	Description	Rock description
1	On site	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel
2	46m E	SUPNM-UNKNOWN	Superficial Theme Not Mapped [for Digital Map Use Only] - Unknown/unclassified Entry	Unknown/unclassified Entry
3	133m SE	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel



ID	Location	LEX Code	Description	Rock description
4	147m W	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel
5	191m SW	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
6	377m NW	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
7	399m NE	GFDUD-XSV	Glaciofluvial Deposits, Devensian - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

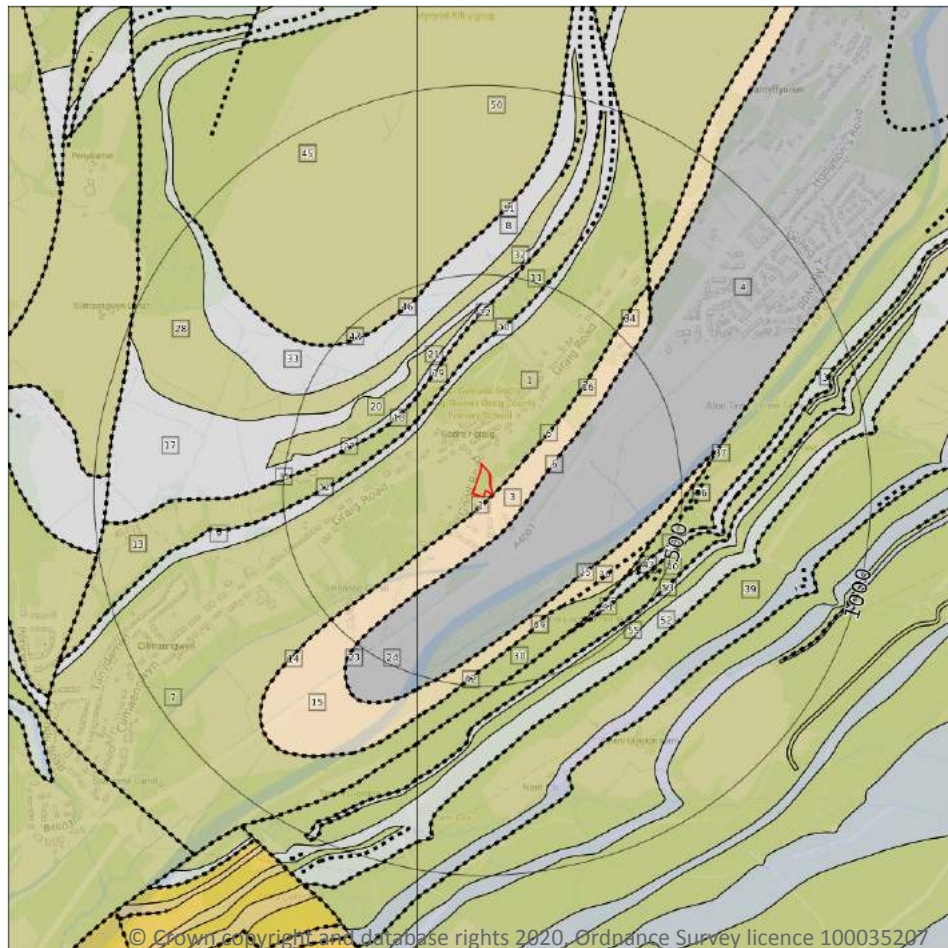
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



- Site Outline
- Search buffers in metres (m)
- Bedrock faults and other linear features (10k)
- Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m

25

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 83**

ID	Location	LEX Code	Description	Rock age
1	On site	LLFB-SDST	Llynfi Member - Sandstone	Bolsovian Sub-age
3	1m SE	SWUCM-MDSS	South Wales Upper Coal Measures Formation - Mudstone, Siltstone And Sandstone	Westphalian D Sub-age - Bolsovian Sub-age
4	84m SE	SWMCM-MDSS	South Wales Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovian Sub-age - Duckmantian Sub-age



ID	Location	LEX Code	Description	Rock age
7	147m W	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
8	186m NW	LLFB-MDSS	Llynfi Member - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age
9	191m NW	LLFB-MDSS	Llynfi Member - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age
11	205m NW	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
13	205m NW	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
15	219m SW	SWUCM-MDSS	South Wales Upper Coal Measures Formation - Mudstone, Siltstone And Sandstone	Westphalian D Sub-age - Bolsovia Sub-age
17	245m NW	LLFB-MDSS	Llynfi Member - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age
20	261m NW	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
21	265m NW	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
24	299m SW	SWMCM-MDSS	South Wales Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age - Duckmantian Sub-age
26	312m SE	SWUCM-MDSS	South Wales Upper Coal Measures Formation - Mudstone, Siltstone And Sandstone	Westphalian D Sub-age - Bolsovia Sub-age
28	332m NW	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
30	346m SE	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
32	347m NW	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
33	373m NW	LLFB-MDSS	Llynfi Member - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age
36	406m SE	LLFB-MDSS	Llynfi Member - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age
39	411m SE	RA-SDST	Rhondda Member - Sandstone	Westphalian D Sub-age - Bolsovia Sub-age
40	416m SE	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age
45	451m NW	RA-SDST	Rhondda Member - Sandstone	Westphalian D Sub-age - Bolsovia Sub-age
50	469m N	RA-SDST	Rhondda Member - Sandstone	Westphalian D Sub-age - Bolsovia Sub-age
52	473m SE	LLFB-MDSS	Llynfi Member - Mudstone, Siltstone And Sandstone	Bolsovia Sub-age
55	487m SE	LLFB-SDST	Llynfi Member - Sandstone	Bolsovia Sub-age

This data is sourced from the British Geological Survey.



14.6 Bedrock faults and other linear features (10k)

Records within 500m

32

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 83**

ID	Location	Category	Description
2	1m SE	ROCK	Coal seam, inferred
5	84m SE	FOSSIL_HORIZON	Fossil horizon, marine band
6	102m NE	ROCK	Coal seam, inferred
10	205m NW	ROCK	Coal seam, inferred
12	205m NW	ROCK	Coal seam, inferred
14	219m SW	ROCK	Coal seam, inferred
16	233m NE	ROCK	Coal seam, inferred
18	245m NW	ROCK	Coal seam, inferred
19	245m NW	ROCK	Coal seam, inferred
22	289m N	ROCK	Coal seam, observed
23	299m SW	FOSSIL_HORIZON	Fossil horizon, marine band
25	312m SE	FOSSIL_HORIZON	Fossil horizon, marine band
27	330m W	ROCK	Coal seam, observed
29	346m SE	ROCK	Coal seam, inferred
31	347m SE	ROCK	Coal seam, inferred
34	399m NE	ROCK	Coal seam, inferred
35	405m W	ROCK	Coal seam, inferred
37	406m SE	FAULT	Normal fault, inferred; crossmarks on downthrow side
38	411m SE	ROCK	Coal seam, inferred
41	416m SE	ROCK	Coal seam, observed
42	423m S	ROCK	Coal seam, inferred
43	436m SE	FAULT	Normal fault, observed; crossmark on downthrow side
44	438m SE	ROCK	Coal seam, inferred

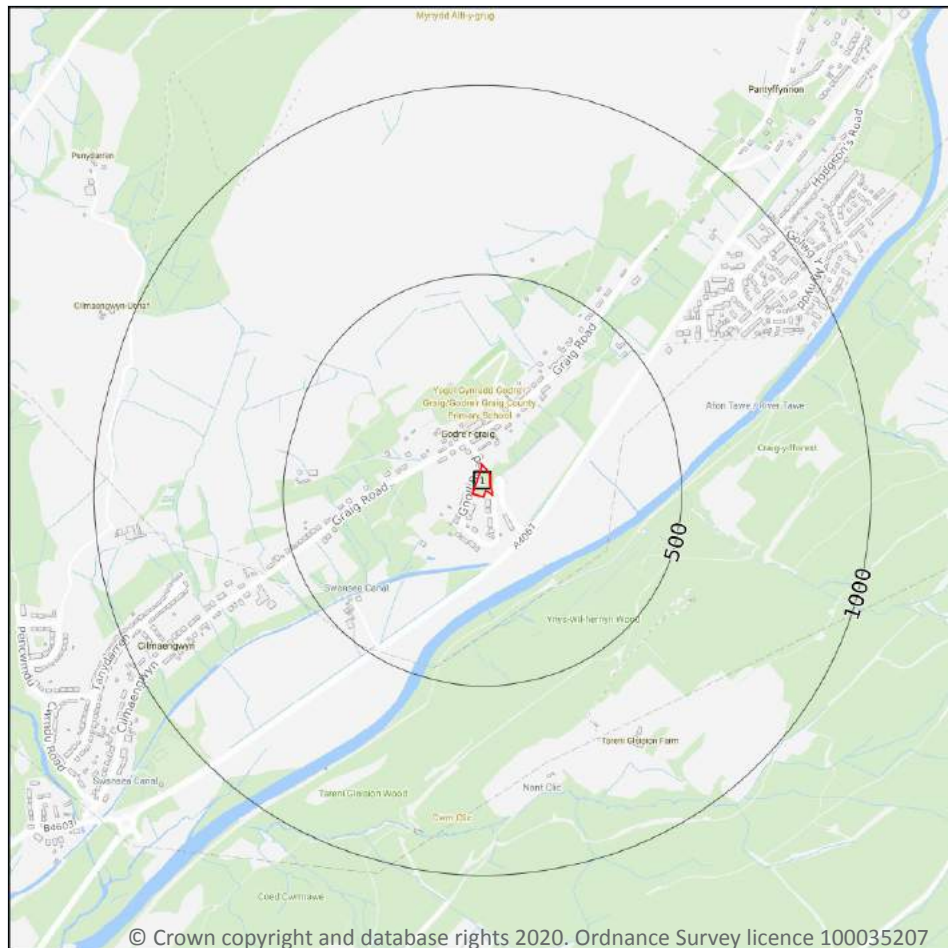


ID	Location	Category	Description
46	451m NW	ROCK	Coal seam, observed
47	451m NW	ROCK	Coal seam, inferred
48	452m SE	ROCK	Coal seam, observed
49	462m SE	FAULT	Normal fault, observed; crossmark on downthrow side
51	469m N	ROCK	Coal seam, observed
53	473m SE	ROCK	Coal seam, inferred
54	484m SE	FAULT	Normal fault, observed; crossmark on downthrow side
56	494m E	FAULT	Normal fault, observed; crossmark on downthrow side
57	497m N	ROCK	Coal seam, observed

This data is sourced from the British Geological Survey.



15 Geology 1:50,000 scale - Availability



— Site Outline
Search buffers in metres (m)

□ Geological map tile

15.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme. Where 50k data is not available, this area has been filled in with 625k scale data.

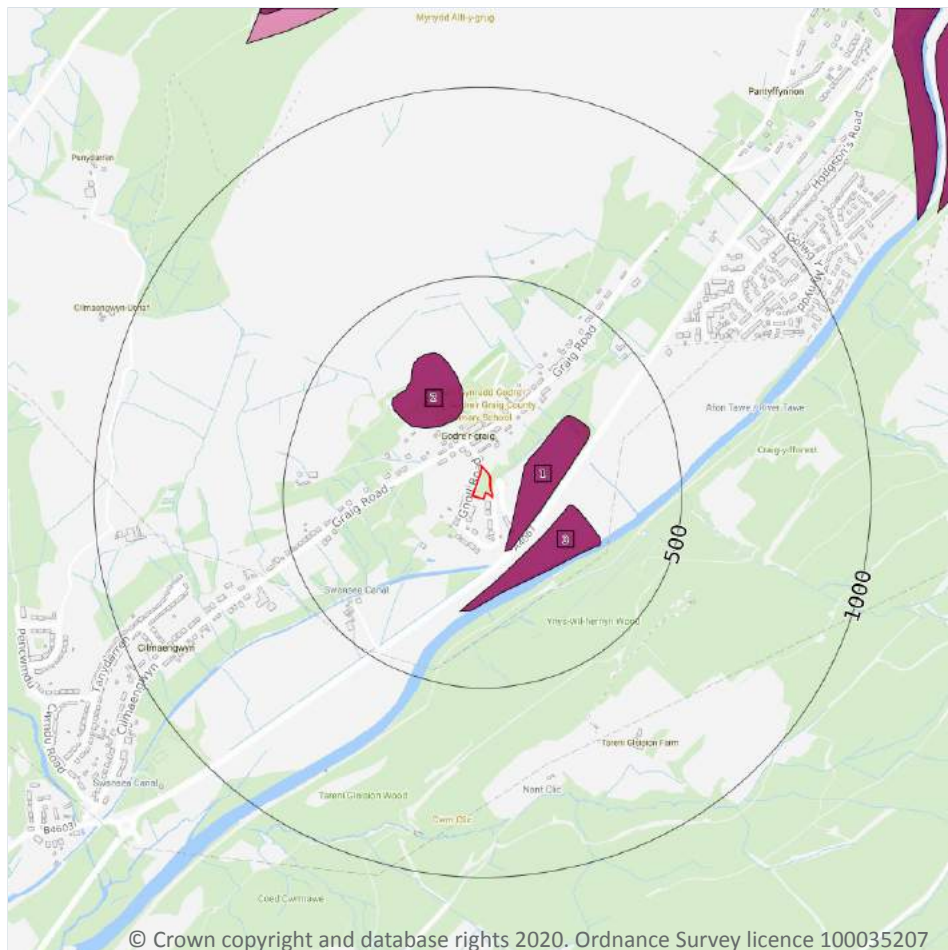
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 87**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW230_amanford_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground



- Site Outline
- Search buffers in metres (m)
- Made ground
 - Worked ground
 - Infilled ground
 - Disturbed ground
 - Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m

3

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 88**

ID	Location	LEX Code	Description	Rock description
1	66m E	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	139m NW	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	166m SE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.



15.3 Artificial ground permeability (50k)

Records within 50m

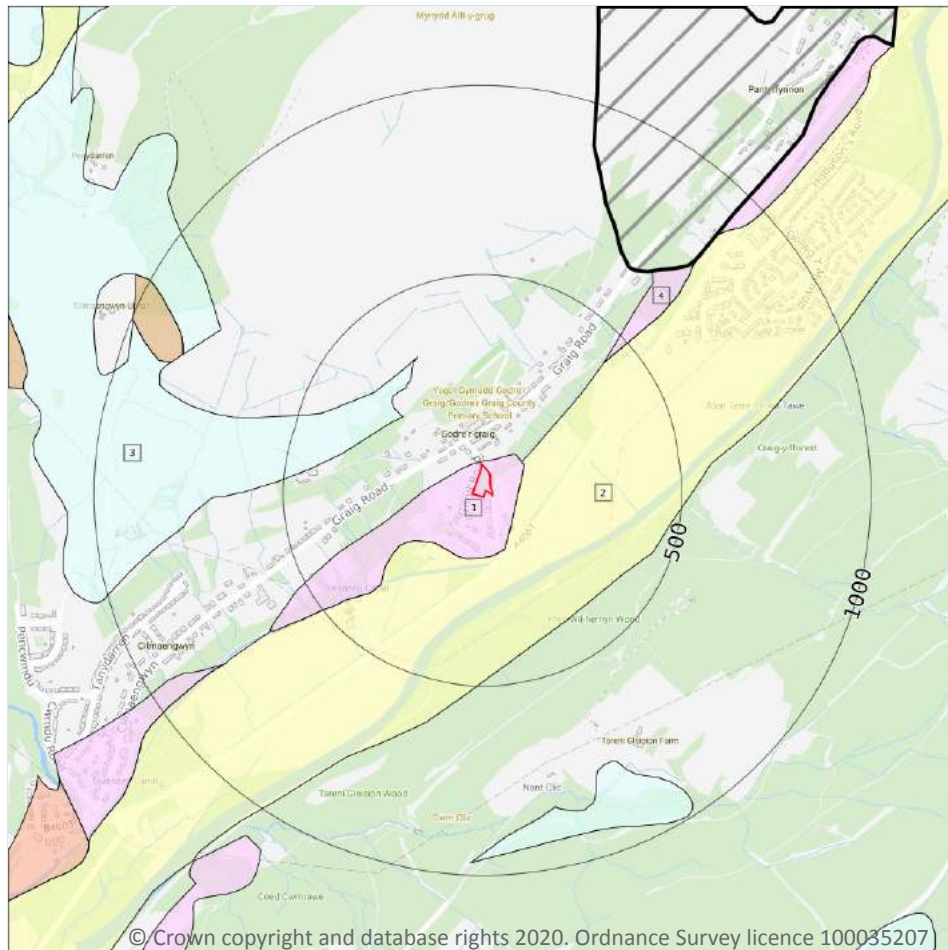
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



— Site Outline
Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m

4

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 90**

ID	Location	LEX Code	Description	Rock description
1	On site	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
2	66m E	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
3	241m NW	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
4	419m NE	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL



This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m

1

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Intergranular	Very High	High

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

15.7 Landslip permeability (50k)

Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m

7

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 92**

ID	Location	LEX Code	Description	Rock age
1	On site	SWUCM-MDSS	SOUTH WALES UPPER COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
3	On site	LLFB-SDST	LLYNFI MEMBER - SANDSTONE	WESTPHALIAN
4	74m SE	SWMCM-MDSS	SOUTH WALES MIDDLE COAL MEASURES FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN



ID	Location	LEX Code	Description	Rock age
7	233m NW	LLFB-MDSS	LLYNFI MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
10	368m NW	LLFB-MDSS	LLYNFI MEMBER - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
11	414m SE	LLFB-SDST	LLYNFI MEMBER - SANDSTONE	WESTPHALIAN
14	450m NW	RA-SDST	RHONDDA MEMBER - SANDSTONE	WESTPHALIAN

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	2
---------------------------	----------

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Fracture	High	Moderate
On site	Fracture	Moderate	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	10
----------------------------	-----------

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 92**

ID	Location	Category	Description
2	On site	ROCK	Coal seam, inferred
5	74m SE	FOSSIL_HORIZON	Marine band
6	195m NW	ROCK	Coal seam, inferred
8	233m NW	ROCK	Coal seam, inferred
9	271m N	ROCK	Coal seam, observed



ID	Location	Category	Description
12	414m SE	FAULT	Fault, inferred, displacement unknown
13	432m SE	ROCK	Coal seam, inferred
15	450m NW	ROCK	Coal seam, inferred
16	450m NW	ROCK	Coal seam, observed
17	469m SE	ROCK	Coal seam, inferred

This data is sourced from the British Geological Survey.



16 Boreholes

16.1 BGS Boreholes

Records within 250m

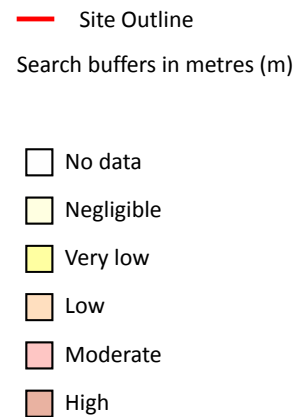
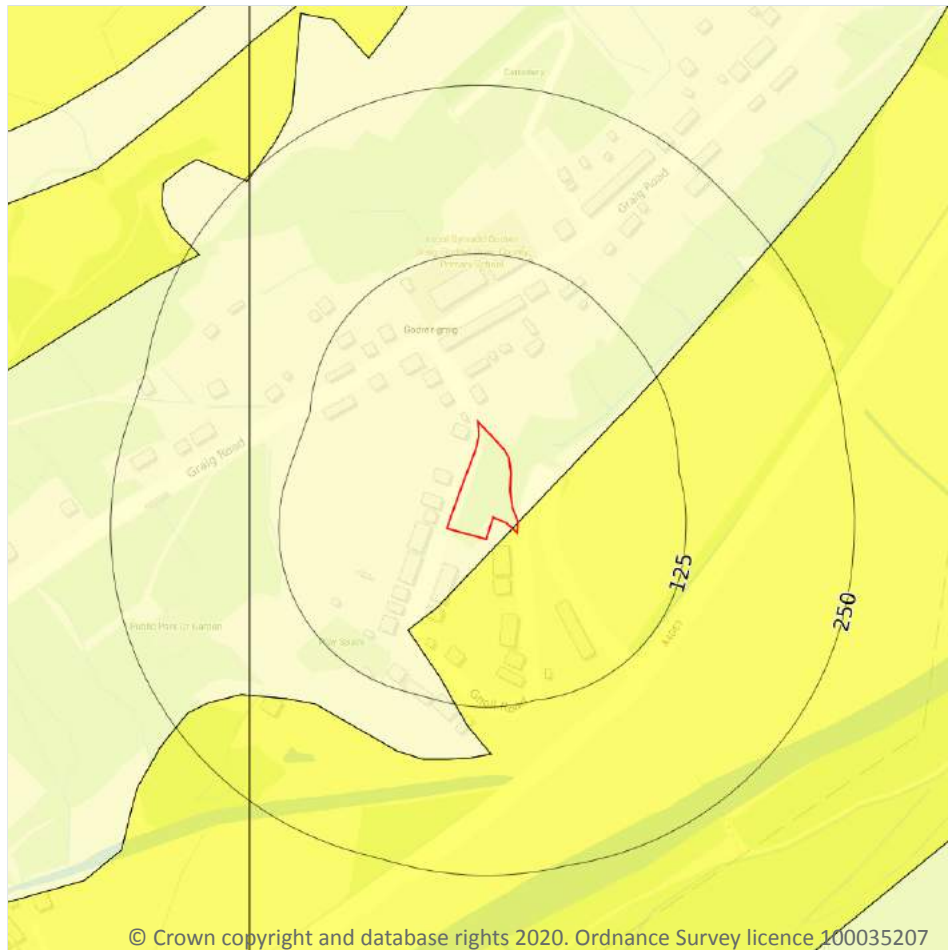
0

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

This data is sourced from the British Geological Survey.



17 Natural ground subsidence - Shrink swell clays



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17.1 Shrink swell clays

Records within 50m

2

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

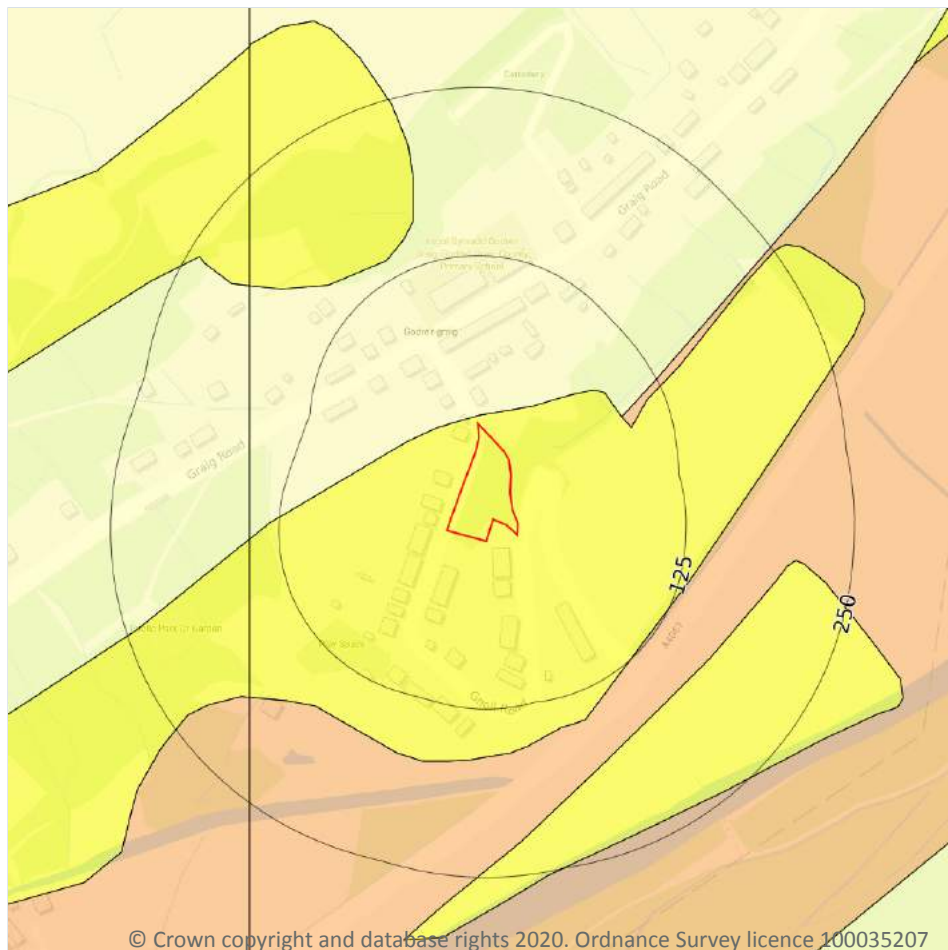
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 96**

Location	Hazard rating	Details
On site	Negligible	Ground conditions predominantly non-plastic.
On site	Very low	Ground conditions predominantly low plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.2 Running sands

Records within 50m

2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

Features are displayed on the Natural ground subsidence - Running sands map on **page 97**

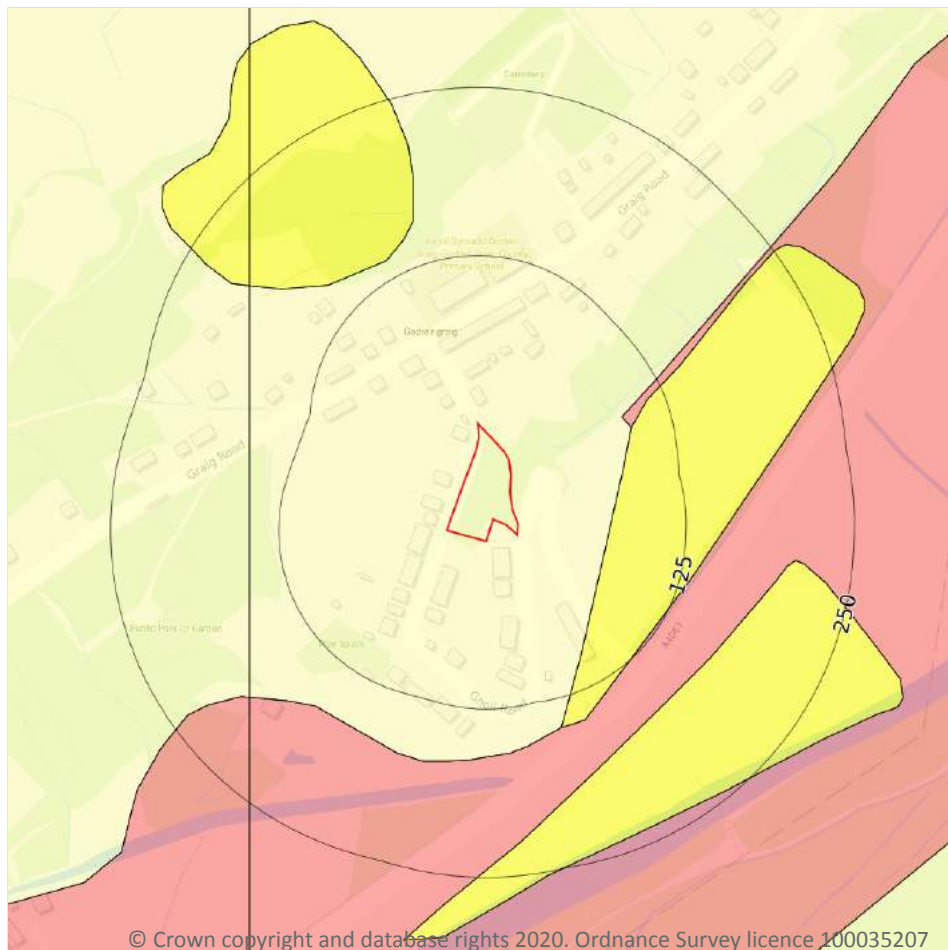
Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

Location	Hazard rating	Details
6m N	Negligible	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



— Site Outline

Search buffers in metres (m)

-  No data
 Negligible
 Very low
 Low
 Moderate
 High

17.3 Compressible deposits

Records within 50m

1

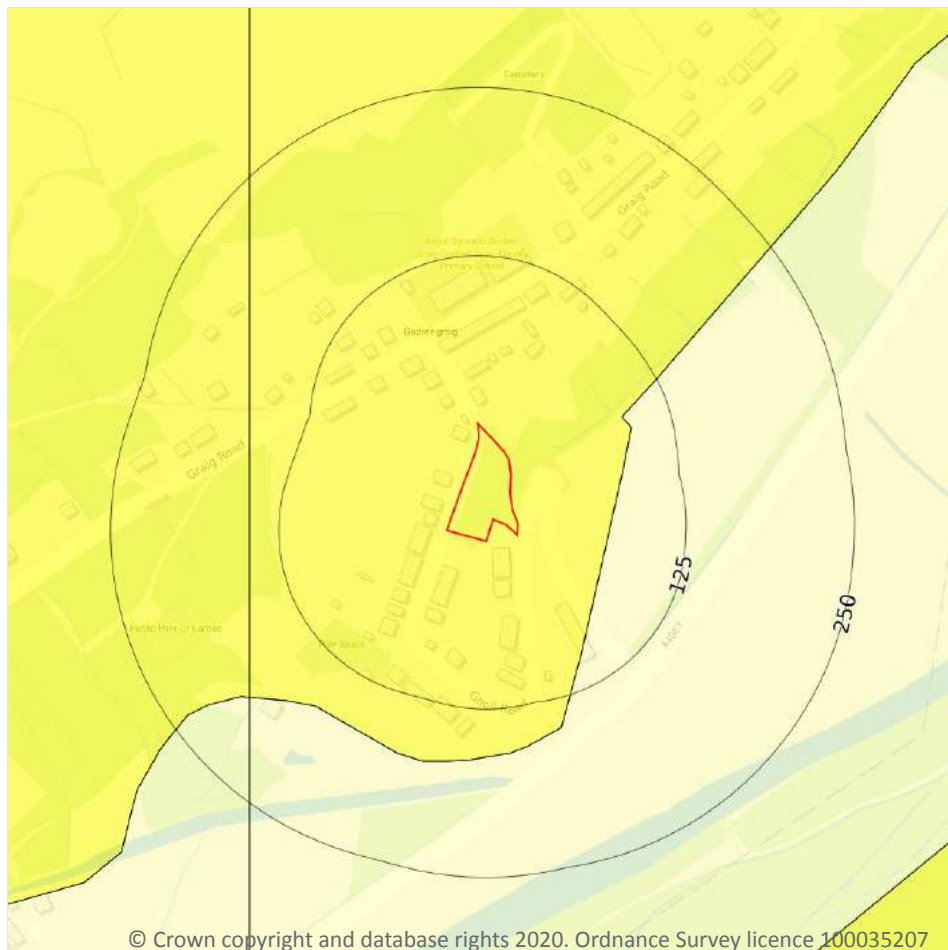
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 99**

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

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17.4 Collapsible deposits

Records within 50m

1

The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

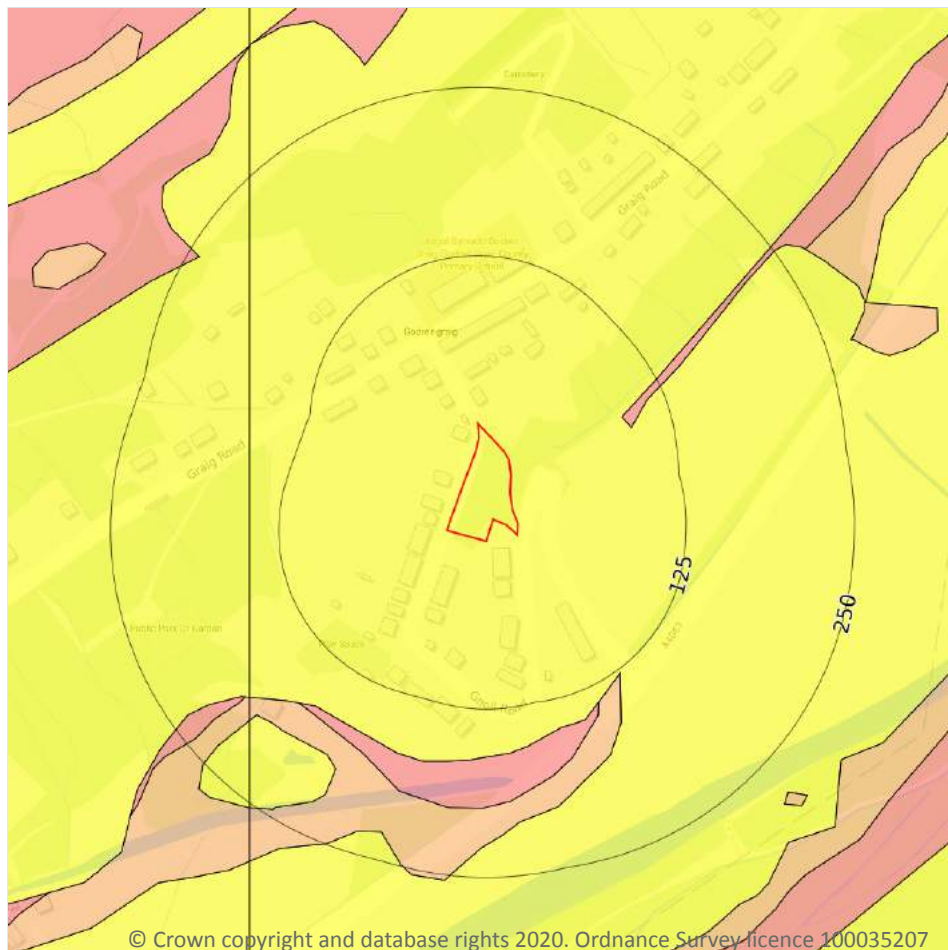
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 100**

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



— Site Outline

Search buffers in metres (m)

-  No data
 Negligible
 Very low
 Low
 Moderate
 High

17.5 Landslides

Records within 50m

1

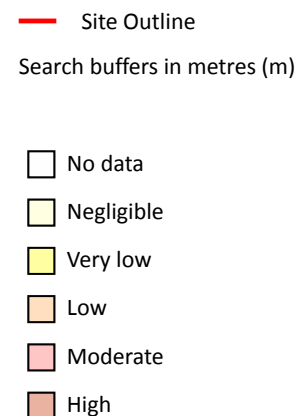
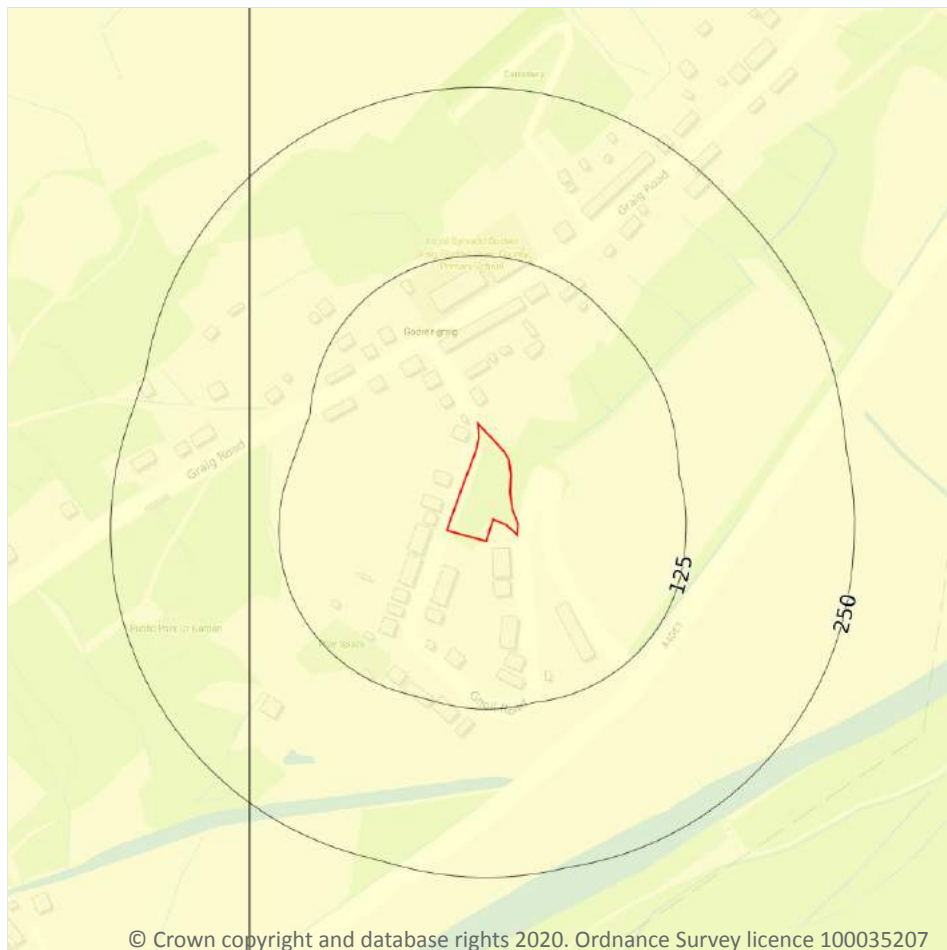
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 101**

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



17.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

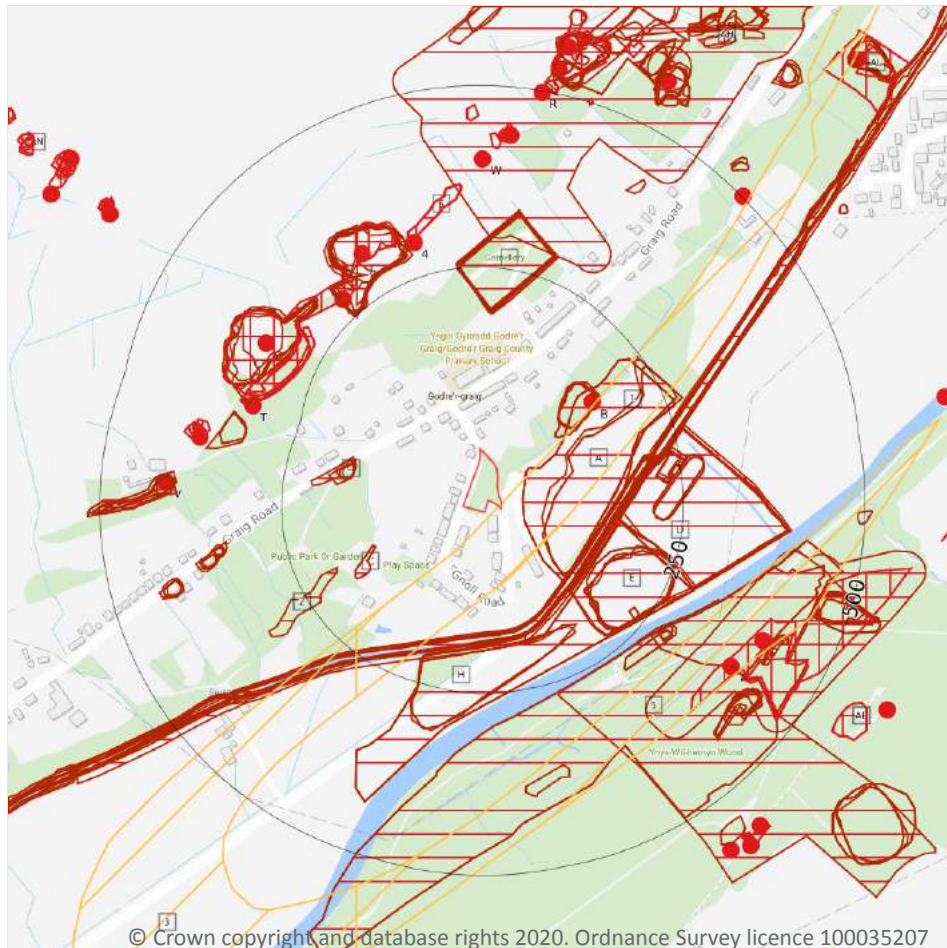
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 102**

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

This data is sourced from the British Geological Survey.



18 Mining, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- ▢ Natural cavities (Area)
 - Natural cavities (Point)
 - BritPits
 - ▢ Surface ground workings
 - ▢ Underground workings
 - ▢ Historical Mineral Planning Areas
 - Mining Cavities
- Non Coal Mining
 - ▢ Sporadic underground mining of restricted extent possible
 - ▢ Localised small scale underground mining possible
 - ▢ Small scale mining possible
 - ▢ Underground mining known or likely within or in close proximity
 - ▢ Underground mining known within or in very close proximity

18.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Peter Brett Associates (PBA).

18.2 BritPits

Records within 500m

14

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining, ground workings and natural cavities map on **page 104**

ID	Location	Details	Description
B	160m NE	Name: Godre'r-graig Address: Ystalyfera, NEATH, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
Q	278m NW	Name: Godre'r-graig Level Address: Godre'r-graig, NEATH, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
4	298m N	Name: Godre'r-graig Level Address: Godre'r-graig, SWANSEA, West Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
J	313m NW	Name: Godre'r-graig Quarry Address: Godre'r-graig, NEATH, Glamorgan Commodity: Sandstone Status: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
T	318m W	Name: Godre'r-graig Level Address: Godre'r-graig, NEATH, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority



ID	Location	Details	Description
O	327m NW	Name: Chwar Pentwyn Address: Godre'r-graig, SWANSEA, West Glamorgan Commodity: Sandstone Status: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
O	353m NW	Name: Chwar Pentwyn Address: Godre'r-graig, SWANSEA, West Glamorgan Commodity: Sandstone Status: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
T	374m W	Name: Pentwyn Address: Ystalyfera, NEATH, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
7	382m SE	Name: Tarreni Gleision Colliery Address: Cilybebyll, YSTALAFERA, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
W	399m N	Name: Godre'r-graig Level Address: Godre'r-graig, NEATH, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
P	403m SE	Name: Tarreni Gleision Colliery, Gleision Shaft Address: Cilybebyll, YSTALAFERA, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
V	410m W	Name: Pentwyn Address: Ystalyfera, NEATH, Glamorgan Commodity: Sandstone Status: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority



ID	Location	Details	Description
W	433m N	Name: Godre'r-graig Level Address: Godre'r-graig, NEATH, Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority
R	497m N	Name: Pentwyn No. 3 Mine Address: Godre'r-graig, SWANSEA, West Glamorgan Commodity: Coal, Deep Status: Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Type: Ceased Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m

68

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 104**

ID	Location	Land Use	Year of mapping	Mapping scale
A	30m E	Refuse Heaps	1965	1:10560
A	30m E	Refuse Heaps	1980	1:10560
A	30m E	Refuse Heaps	1983	1:10000
A	57m E	Refuse Heap	1948	1:10560
A	65m E	Refuse Heap	1948	1:10560
A	65m E	Refuse Heap	1948	1:10560
B	92m NE	Unspecified Quarry	1913	1:10560
B	92m NE	Unspecified Quarry	1913	1:10560
B	106m NE	Unspecified Quarry	1948	1:10560
B	107m NE	Unspecified Quarry	1948	1:10560
B	108m NE	Unspecified Quarry	1913	1:10560
B	108m NE	Unspecified Quarry	1921	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
A	127m SE	Canal	1913	1:10560
A	127m SE	Canal	1913	1:10560
A	128m SE	Canal	1948	1:10560
A	129m SE	Canal	1921	1:10560
A	129m SE	Canal	1948	1:10560
A	131m SE	Canal	1913	1:10560
A	131m SE	Canal	1897	1:10560
C	133m SW	Unspecified Heap	1980	1:10560
C	133m SW	Unspecified Heap	1983	1:10000
A	136m SE	Canal	1877	1:10560
D	141m SE	Sewage Works	1913	1:10560
D	142m SE	Sewage Works	1948	1:10560
E	147m SE	Refuse Heaps	1965	1:10560
E	147m SE	Refuse Heaps	1980	1:10560
E	147m SE	Unspecified Ground Workings	1983	1:10000
F	151m SE	Refuse Heap	1913	1:10560
F	151m SE	Refuse Heap	1913	1:10560
G	157m W	Refuse Heap	1948	1:10560
G	157m W	Refuse Heap	1913	1:10560
G	157m W	Refuse Heap	1921	1:10560
G	158m W	Refuse Heap	1948	1:10560
G	158m W	Refuse Heap	1948	1:10560
F	159m SE	Refuse Heap	1948	1:10560
F	159m SE	Refuse Heap	1948	1:10560
D	160m E	Sewage Works	1913	1:10560
D	160m E	Sewage Works	1913	1:10560
F	160m SE	Refuse Heap	1948	1:10560
F	161m SE	Refuse Heap	1913	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
F	161m SE	Refuse Heap	1921	1:10560
D	162m E	Sewage Works	1948	1:10560
D	162m E	Sewage Works	1948	1:10560
D	167m E	Sewage Works	1921	1:10560
H	178m S	Refuse Heap	1948	1:10560
H	182m S	Refuse Heap	1948	1:10560
H	182m S	Refuse Heap	1948	1:10560
I	186m N	Burial Ground	1913	1:10560
I	186m N	Burial Ground	1897	1:10560
I	188m N	Burial Ground	1921	1:10560
I	188m N	Cemetery	1877	1:10560
I	190m N	Cemetery	1965	1:10560
I	190m N	Cemetery	1980	1:10560
I	190m N	Cemetery	1983	1:10000
I	190m N	Burial Ground	1948	1:10560
I	190m N	Burial Ground	1948	1:10560
I	191m N	Burial Ground	1913	1:10560
I	191m N	Burial Ground	1913	1:10560
2	193m SW	Unspecified Ground Workings	1990	1:10000
D	209m E	Filter Beds	1913	1:10560
D	209m E	Filter Beds	1913	1:10560
D	210m E	Filter Beds	1948	1:10560
D	210m E	Filter Beds	1948	1:10560
D	216m E	Filter Beds	1948	1:10560
D	216m E	Filter Beds	1948	1:10560
D	216m E	Filter Beds	1948	1:10560
D	216m E	Filter Beds	1913	1:10560
D	219m E	Filter Beds	1921	1:10560

This is data is sourced from Ordnance Survey/Groundsure.



18.4 Underground workings

Records within 1000m

131

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on **page 104**

ID	Location	Land Use	Year of mapping	Mapping scale
O	267m NW	Coal Level	1921	1:10560
O	269m NW	Coal Level	1913	1:10560
O	269m NW	Coal Level	1897	1:10560
Q	274m NW	Old Coal Level	1897	1:10560
O	275m NW	Unspecified Disused Levels	1965	1:10560
S	300m N	Unspecified Disused Levels	1965	1:10560
S	300m N	Unspecified Disused Levels	1980	1:10560
S	300m N	Unspecified Disused Levels	1983	1:10000
J	303m NW	Unspecified Disused Levels	1965	1:10560
J	303m NW	Unspecified Disused Levels	1980	1:10560
T	320m W	Coal Level	1948	1:10560
T	364m W	Old Coal Level	1921	1:10560
T	366m W	Old Coal Level	1913	1:10560
T	366m W	Old Coal Level	1897	1:10560
T	367m W	Unspecified Disused Levels	1990	1:10000
T	367m W	Old Coal Level	1948	1:10560
P	368m SE	Colliery	1921	1:10560
T	372m W	Unspecified Disused Levels	1965	1:10560
P	405m SE	Unspecified Disused Mine	1965	1:10560
P	405m SE	Unspecified Disused Mine	1980	1:10560
P	405m SE	Unspecified Disused Mine	1983	1:10000
W	414m N	Unspecified Disused Levels	1983	1:10000
W	423m N	Old Coal Level	1948	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
W	424m N	Old Coal Level	1913	1:10560
W	424m N	Old Coal Level	1897	1:10560
W	429m N	Old Coal Level	1921	1:10560
W	432m N	Coal Level	1913	1:10560
W	432m N	Coal Level	1897	1:10560
W	433m N	Coal Level	1948	1:10560
W	438m N	Coal Level	1921	1:10560
W	452m N	Unspecified Disused Levels	1983	1:10000
R	497m N	Coal Level	1948	1:10560
R	499m N	Coal Level	1948	1:10560
R	523m N	Unspecified Disused Levels	1965	1:10560
R	523m N	Unspecified Disused Levels	1980	1:10560
AB	545m SE	Unspecified Mines	1965	1:10560
AB	545m SE	Unspecified Level	1983	1:10000
R	551m N	Disused Coal Level	1877	1:10560
AA	558m SE	Old Coal Level	1948	1:10560
AA	561m SE	Old Coal Level	1921	1:10560
AA	561m SE	Old Coal Level	1913	1:10560
AA	561m SE	Coal Level	1897	1:10560
AA	566m SE	Unspecified Disused Levels	1983	1:10000
R	572m N	Coal Level	1877	1:10560
R	578m N	Coal Level	1913	1:10560
R	578m N	Coal Level	1897	1:10560
R	579m N	Unspecified Disused Mine	1965	1:10560
R	579m N	Unspecified Disused Mine	1980	1:10560
R	579m N	Unspecified Mine	1983	1:10000
R	583m NE	Old Coal Level	1921	1:10560
R	584m N	Coal Level	1948	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
AE	602m NW	Unspecified Disused Levels	1990	1:10000
AE	606m NW	Old Coal Level	1921	1:10560
AE	606m NW	Unspecified Disused Levels	1965	1:10560
AE	607m NW	Old Coal Level	1913	1:10560
AE	607m NW	Old Coal Level	1897	1:10560
AE	607m NW	Old Coal Level	1948	1:10560
AF	610m E	Unspecified Disused Level	1965	1:10560
AF	610m E	Unspecified Disused Level	1980	1:10560
-	613m N	Unspecified Mine	1965	1:10560
-	613m N	Unspecified Mine	1980	1:10560
-	627m N	Coal Level	1921	1:10560
AH	635m NE	Unspecified Disused Level	1983	1:10000
-	638m N	Unspecified Disused Level	1983	1:10000
-	651m N	Unspecified Disused Level	1965	1:10560
-	651m N	Unspecified Disused Level	1980	1:10560
-	651m N	Unspecified Disused Level	1983	1:10000
AK	676m NW	Unspecified Disused Levels	1990	1:10000
AK	679m NW	Old Coal Level	1913	1:10560
AK	681m NW	Old Coal Level	1948	1:10560
AK	681m NW	Old Coal Level	1921	1:10560
AK	682m NW	Unspecified Disused Levels	1965	1:10560
AK	683m NW	Old Coal Level	1897	1:10560
AL	705m NE	Unspecified Mine	1965	1:10560
AL	705m NE	Unspecified Mine	1980	1:10560
AL	705m NE	Unspecified Mine	1983	1:10000
-	713m S	Colliery	1877	1:10560
AL	732m NE	Disused Coal Pit	1877	1:10560
AN	737m NW	Coal Level	1948	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
AN	738m NW	Coal Level	1913	1:10560
-	744m E	Unspecified Mine	1965	1:10560
-	744m E	Unspecified Mine	1980	1:10560
AN	744m NW	Coal Level	1921	1:10560
AN	745m NW	Unspecified Disused Levels	1990	1:10000
AN	746m NW	Unspecified Disused Levels	1965	1:10560
-	772m S	Old Air Shaft	1921	1:10560
-	773m S	Old Air Shaft	1948	1:10560
-	775m S	Old Air Shaft	1913	1:10560
-	775m S	Air Shaft	1897	1:10560
-	776m S	Disused Air Shaft	1965	1:10560
-	776m S	Disused Air Shaft	1980	1:10560
-	776m S	Disused Air Shaft	1983	1:10000
-	784m S	Air Shaft	1877	1:10560
AN	785m NW	Unspecified Disused Levels	1990	1:10000
AN	787m NW	Unspecified Disused Levels	1965	1:10560
-	788m E	Coal Levels	1913	1:10560
-	788m E	Coal Levels	1897	1:10560
-	793m E	Old Coal Level	1948	1:10560
-	805m E	Old Coal Level	1921	1:10560
-	849m N	Unspecified Disused Levels	1965	1:10560
-	849m N	Unspecified Disused Levels	1980	1:10560
-	849m N	Unspecified Disused Levels	1983	1:10000
-	855m E	Coal Levels	1913	1:10560
-	855m E	Coal Levels	1897	1:10560
-	860m N	Old Coal Levels	1913	1:10560
-	860m N	Old Coal Levels	1897	1:10560
-	869m S	Old Coal Level	1948	1:10560

ID	Location	Land Use	Year of mapping	Mapping scale
-	869m S	Old Coal Level	1921	1:10560
-	869m N	Old Coal Levels	1921	1:10560
-	871m S	Old Coal Level	1913	1:10560
-	882m S	Old Coal Level	1897	1:10560
-	889m S	Coal Level	1877	1:10560
-	921m NE	Old Coal Levels	1921	1:10560
-	923m NE	Old Coal Levels	1948	1:10560
-	924m NE	Old Coal Levels	1913	1:10560
-	924m NE	Old Coal Levels	1897	1:10560
-	928m NE	Unspecified Disused Level	1983	1:10000
-	933m N	Unspecified Disused Level	1965	1:10560
-	933m N	Unspecified Disused Level	1980	1:10560
-	933m N	Unspecified Disused Level	1983	1:10000
-	936m E	Old Coal Level	1948	1:10560
-	938m E	Unspecified Disused Level	1983	1:10000
-	940m E	Old Coal Level	1913	1:10560
-	940m E	Old Coal Level	1897	1:10560
-	952m N	Old Coal Level	1948	1:10560
-	953m N	Old Coal Level	1913	1:10560
-	953m N	Coal Levels	1897	1:10560
-	958m N	Old Coal Level	1921	1:10560
-	987m E	Coal Level	1877	1:10560
-	993m E	Unspecified Disused Levels	1983	1:10000
-	998m S	Old Coal Level	1921	1:10560

This is data is sourced from Ordnance Survey/Groundsure.



18.5 Historical Mineral Planning Areas

Records within 500m

0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m

3

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

Features are displayed on the Mining, ground workings and natural cavities map on **page 104**

ID	Location	Name	Commodity	Class	Likelihood
1	On site	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
3	221m SW	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
5	306m SE	Not available	Iron Ore (Bedded)	B	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m

1

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

Features are displayed on the Mining, ground workings and natural cavities map on **page 104**



ID	Location	Mine Address	Mineral	Data source	Publisher
AL	757m NE	Frampton On Severn, West Glamorgan	Unknown	-	-

This data is sourced from Peter Brett Associates (PBA).

18.8 JPB mining areas

Records on site	0
------------------------	----------

Areas which could be affected by former coal mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site	1
------------------------	----------

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.

This data is sourced from the Coal Authority.

18.10 Brine areas

Records on site	0
------------------------	----------

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site	0
------------------------	----------

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site	0
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Mining Searches UK.

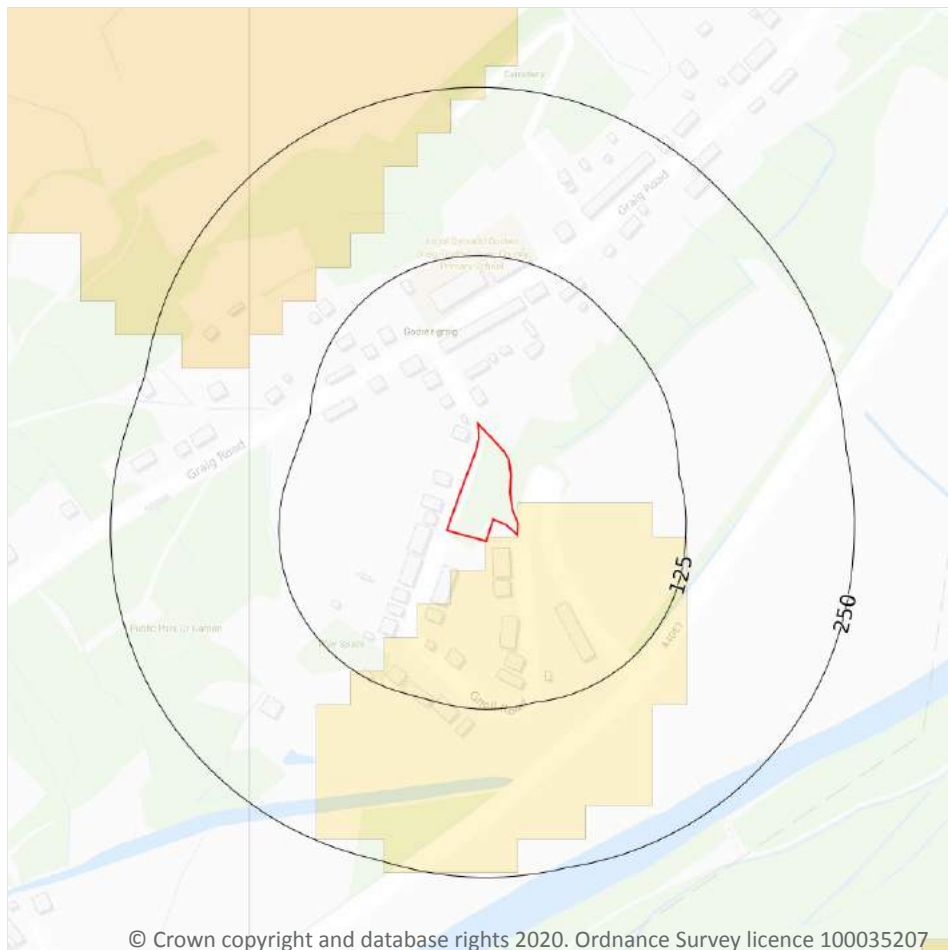
18.13 Clay mining

Records on site	0
-----------------	---

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Radon



— Site Outline
Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

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19.1 Radon

Records on site

2

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on **page 118**

Location	Estimated properties affected	Radon Protection Measures required
On site	Between 1% and 3%	None
On site	Less than 1%	None**



This data is sourced from the British Geological Survey and Public Health England.



20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m

3

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
On site	35 - 45 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	30 - 45 mg/kg
6m N	35 - 45 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m

0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



21 Railway infrastructure and projects



- Site Outline
- Search buffers in metres (m)
- C1 Crossrail 1 Stations
- Crossrail 1 Route
- Crossrail 1 Worksites
- C2 Crossrail 2 Stations
- Crossrail 2 Route
- Crossrail 2 Worksites
- Crossrail 2 Safeguarding
- Crossrail 2 Headhouses
- Railway stations
- ... Active railways
- ... Active tunnels
- ... Abandoned railways
- Historic railways
- Historic tunnels
- Underground stations
- Underground Lines
- Royal Mail tunnels
- HS2 optimised route
- HS2 Stations
- HS2 Depots
- HS2 Surface Safeguarding
- HS2 Subsurface Safeguarding

21.1 Underground railways (London)

Records within 250m

0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m

0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.



This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m

10

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 121**

Location	Land Use	Year of mapping	Mapping scale
27m E	Railway Sidings	1948	10560
30m E	Railway Sidings	1948	10560
30m E	Railway Sidings	1913	10560
38m E	Railway Sidings	1913	10560
40m E	Railway Sidings	1921	10560
73m E	Tramway Sidings	1918	2500
171m SE	Railway Sidings	1948	10560
226m SE	Railway Sidings	1913	10560
226m SE	Railway Sidings	1918	2500
242m SE	Railway Sidings	1965	10560

This data is sourced from Ordnance Survey/Groundsure.

21.5 Royal Mail tunnels

Records within 250m

0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.



This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m	0
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Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m	0
---------------------	---

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m	0
---------------------	---

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m	0
---------------------	---

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

21.10 HS2

Records within 500m	0
---------------------	---

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

Terms and conditions

Groundsure's Terms and Conditions can be accessed at this link: <https://www.groundsure.com/terms-and-conditions-jan-2020/>.



APPENDIX B

TRIAL PIT PHOTOGRAPHS AND LOGS TO BS5930:2015

Project: KNOLL ROAD, GODREGRAIG	Project No: GRG 10
Described By: R. DAVIES	Trial Pit No. TP1
Date: 8/09/2020	Sheet: 1 of 1
Method / Plant TRACKED EXCAVATOR	Groundwater Observations: DRY
Stability GOOD	Strike of Face A:
Shoring NONE	Loggers Signature

FACE SKETCHES - INCLUDING ANY SIGNIFICANT FINDINGS WITHIN TRIAL PIT

Samples and Tests		Strata	
Depth (m)	Type (B,D,ES)	Depth (m)	Strata Description
		G.L.	TOPSOIL. Soft dark brown gravelly, sandy clay with roots.
		0.2	
		1.6	Firm to stiff, yellowish brown, very gravelly, very sandy CLAY. Gravel is angular to subrounded, fine to coarse of Pennant Sandstone and Quartzite. High cobble content to 220mm diameter.
0.5	ES 1		

Notes: ES-Environmental Soil
 EW - Environmental Water
 B - Bulk Disturbed
 D - Small Disturbed

TRIAL PIT NUMBER

TP 1 Sheet 1 of 1



FIGURE 19
TP 1

FACE SKETCHES - INCLUDING ANY SIGNIFICANT FINDINGS WITHIN TRIAL PIT

Notes: ES-Environmental Soil EW - Environmental Water B - Bulk Disturbed D - Small Disturbed		TRIAL PIT NUMBER TP 2 Sheet 1 of 1
---	--	---



FIGURE 20
TP 2

Project: KNOLL ROAD, GODREGRAIG	Project No: GRG 10
Described By: R. DAVIES	Trial Pit No. TP3
Date: 8/09/2020	Sheet: 1 of 1
Method / Plant TRACKED EXCAVATOR	Groundwater Observations: DRY
Stability GOOD	Strike of Face A:
Shoring NONE	Loggers Signature

FACE SKETCHES - INCLUDING ANY SIGNIFICANT FINDINGS WITHIN TRIAL PIT

Samples and Tests		Strata	
Depth (m)	Type (B,D,ES)	Depth (m)	Strata Description
		G.L.	TOPSOIL. Soft dark brown gravelly, sandy clay with roots.
		0.15	
0.3	ES 1	1.2	Firm to stiff, yellowish brown, very gravelly, very sandy CLAY. Gravel is angular to subrounded, fine to coarse of Pennant Sandstone and Quartzite. High cobble content to 320mm diameter.

Notes: ES-Environmental Soil
 EW - Environmental Water
 B - Bulk Disturbed
 D - Small Disturbed

TRIAL PIT NUMBER

TP 3 Sheet 1 of 1



FIGURE 21
TP 3

Project: KNOLL ROAD, GODREGRAIG	Project No: GRG 10
Described By: R. DAVIES	Trial Pit No. TP4
Date: 8/09/2020	Sheet: 1 of 1
Method / Plant TRACKED EXCAVATOR	Groundwater Observations: DRY
Stability GOOD	Strike of Face A:
Shoring NONE	Loggers Signature

FACE SKETCHES - INCLUDING ANY SIGNIFICANT FINDINGS WITHIN TRIAL PIT

Samples and Tests		Strata	
Depth (m)	Type (B,D,ES)	Depth (m)	Strata Description
		G.L.	TOPSOIL. Soft dark brown gravelly, sandy clay with roots.
		0.15	
		1.2	Firm to stiff, yellowish brown, very gravelly, very sandy CLAY. Gravel is angular to subrounded, fine to coarse of Pennant Sandstone and Quartzite. High cobble content to 350mm diameter.
0.4	ES 1		

Notes: ES-Environmental Soil
 EW - Environmental Water
 B - Bulk Disturbed
 D - Small Disturbed

TRIAL PIT NUMBER

TP 4 Sheet 1 of 1



FIGURE 22
TP 4

Project: KNOLL ROAD, GODREGRAIG	Project No: GRG 10
Described By: R. DAVIES	Trial Pit No. TP5
Date: 8/09/2020	Sheet: 1 of 1
Method / Plant TRACKED EXCAVATOR	Groundwater Observations: DRY
Stability GOOD	Strike of Face A:
Shoring NONE	Loggers Signature

FACE SKETCHES - INCLUDING ANY SIGNIFICANT FINDINGS WITHIN TRIAL PIT

Samples and Tests		Strata	
Depth (m)	Type (B,D,ES)	Depth (m)	Strata Description
		G.L.	MADE GROUND. Loose black gravelly, clayey sand. Gravel is angular to rounded. Fin to coarse of sandstone and brick. Occasional plastic.
0.4	ES 1		
		0.8	Firm to stiff, yellowish brown, very gravelly, very sandy CLAY. Gravel is angular to subrounded, fine to coarse of Pennant Sandstone and Quartzite. High cobble content to 220mm diameter.
		1.6	

Notes: ES-Environmental Soil
 EW - Environmental Water
 B - Bulk Disturbed
 D - Small Disturbed

TRIAL PIT NUMBER
TP 5 Sheet 1 of 1



FIGURE 23
TP 5

APPENDIX C

ELAB

LABORATORY RESULTS



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Ponswood Industrial Estate
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THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 20-29814

Issue: 2. Replaces Analytical Report number 20-29814; issue no.1

Date of Issue: 29/09/2020

Contact: Richard Davies

Customer Details: Rhondda Geotechnical Services
56 Meyler Street
Thomastown
Porth
CF39 8EA

Quotation No: Q19-01527

Order No: Not Supplied

Customer Reference: GRG 10

Date Received: 11/09/2020

Date Approved: 29/09/2020

Details: Godregraig

Approved by: 

Mike Varley, Technical Manager

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Sample Summary

Report No.: 20-29814, issue number 2

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
213718	TP1 ES1 0.50	08/09/2020	11/09/2020	Sandy silty loam	
213719	TP2 ES1 0.50	08/09/2020	11/09/2020	Silty loam	
213720	TP3 ES1 0.30	08/09/2020	11/09/2020	Sandy silty loam	
213721	TP4 ES1 0.40	08/09/2020	11/09/2020	Sandy silty loam	
213722	TP5 ES1 0.40	08/09/2020	11/09/2020	Silty loam	

Results Summary

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ELAB Reference	213718	213719	213720	213721	213722
Customer Reference	ES1	ES1	ES1	ES1	ES1
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP1	TP2	TP3	TP4	TP5
Sample Depth (m)	0.50	0.50	0.30	0.40	0.40
Sampling Date	08/09/2020	08/09/2020	08/09/2020	08/09/2020	08/09/2020

Determinand	Codes	Units	LOD					
Soil sample preparation parameters								
Moisture Content	N	%	0.1	13.1	19.0	12.7	15.1	17.6
Material removed	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Description of Inert material removed	N		0	None	None	None	None	None
Metals								
Arsenic	M	mg/kg	1	16.9	51.4	17.2	19.8	19.0
Cadmium	M	mg/kg	0.5	< 0.5	0.9	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	19.4	22.4	17.3	16.9	16.5
Copper	M	mg/kg	5	37.0	57.3	37.1	39.7	27.4
Lead	M	mg/kg	5	34.2	62.0	27.7	27.6	20.8
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	29.8	29.1	26.1	23.3	9.7
Selenium	M	mg/kg	1	< 1.0	1.6	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	114	140	97.6	92.3	53.6
Inorganics								
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Miscellaneous								
pH	M	pH units	0.1	6.2	6.7	6.9	6.7	7.1
Soil Organic Matter	U	%	0.1	1.4	2.8	2.0	3.1	1.7
Total Organic Carbon	N	%	0.01	1.3	4.0	1.7	2.5	1.1
Phenols								
Phenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
M,P-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
O-Cresol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
3,4-Dimethylphenol	N	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3-Dimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
2,3,5-trimethylphenol	M	mg/kg	1	< 1	< 1	< 1	< 1	< 1
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.1	0.7	0.1	< 0.1	< 0.1
Pyrene	M	mg/kg	0.1	0.1	0.6	0.1	< 0.1	< 0.1
Benzo(a)anthracene	M	mg/kg	0.1	< 0.1	0.4	< 0.1	< 0.1	< 0.1
Chrysene	M	mg/kg	0.1	< 0.1	0.5	0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	M	mg/kg	0.1	< 0.1	0.5	0.2	< 0.1	0.2
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	0.6	0.2	< 0.1	< 0.1
Benzo(a)pyrene	M	mg/kg	0.1	< 0.1	0.5	0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	M	mg/kg	0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	0.3	< 0.1	< 0.1	0.1
Total PAH(16)	M	mg/kg	0.4	1.0	4.8	1.2	< 0.4	1.0



Results Summary

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ELAB Reference	213718	213719	213720	213721	213722
Customer Reference	ES1	ES1	ES1	ES1	ES1
Sample ID					
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	TP1	TP2	TP3	TP4	TP5
Sample Depth (m)	0.50	0.50	0.30	0.40	0.40
Sampling Date	08/09/2020	08/09/2020	08/09/2020	08/09/2020	08/09/2020

Determinand	Codes	Units	LOD					
TPH CWG								
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aliphatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	M	mg/kg	1	< 1.0	1.1	< 1.0	< 1.0	< 1.0
>C35-C40 Aromatic	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total aromatic hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	1.9	< 1.0	< 1.0	< 1.0
Total petroleum hydrocarbons (>C5 - C40)	N	mg/kg	1	< 1.0	2.4	< 1.0	< 1.0	1.2



Results Summary

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ELAB Reference	213719
Customer Reference	ES1
Sample ID	
Sample Type	SOIL
Sample Location	TP2
Sample Depth (m)	0.50
Sampling Date	08/09/2020

Determinand	Codes	Units	LOD	
Metals				
Arsenic 10:1 extract	N	ug/l	5	< 5
Boron 10:1 extract	N	ug/l	5	7
Cadmium 10:1 extract	N	ug/l	1	< 1
Chromium 10:1 extract	N	ug/l	5	< 5
Copper 10:1 extract	N	ug/l	5	< 5
Lead 10:1 extract	N	ug/l	5	< 5
Mercury 10:1 extract	N	ug/l	0.1	< 0.1
Nickel 10:1 extract	N	ug/l	5	< 5
Selenium 10:1 extract	N	ug/l	5	< 5
Zinc 10:1 extract	N	ug/l	5	< 5
Inorganics				
Hexavalent chromium	N	ug/l	100	< 100



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Results Summary

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Asbestos Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Asbestos Identification	Gravimetric Analysis Total (%)	Gravimetric Analysis by ACM Type (%)	Free Fibre Analysis (%)	Total Asbestos (%)
213718	0.50	TP1 ES1	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
213719	0.50	TP2 ES1	Brown Soil, Stones, Clinker, Concrete	No asbestos detected	n/t	n/t	n/t	n/t
213720	0.30	TP3 ES1	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
213721	0.40	TP4 ES1	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t
213722	0.40	TP5 ES1	Brown Soil, Stones, Clinker	No asbestos detected	n/t	n/t	n/t	n/t

Method Summary

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Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
pH	M	Air dried sample	14/09/2020	113	Electromeric
Phenols in solids	M	As submitted sample	14/09/2020	121	HPLC
PAH (GC-FID)	M	As submitted sample	14/09/2020	133	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	14/09/2020	181	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	14/09/2020	181	GC-MS
Total cyanide	M	As submitted sample	14/09/2020	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	15/09/2020	210	IR
TPH CWG soil by gc-gc	M	As submitted sample	14/09/2020	271	
Asbestos identification	U	Air dried sample	15/09/2020	280	Microscopy
Aqua regia extractable metals	M	Air dried sample	14/09/2020	300	ICPMS
Leachate metals 10:1 extract	N		25/09/2020	301	ICPMS
Soil organic matter	U	Air dried sample	16/09/2020	BS1377:P3	Titrimetry

Tests marked N are not UKAS accredited

Report Information

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Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

LOD LOD refers to limit of detection, except in the case of pH soils and pH waters where it means limit of discrimination.
Soil sample results are expressed on an air dried basis (dried at < 30°C), and are uncorrected for inert material removed.
ELAB are unable to provide an interpretation or opinion on the content of this report.
The results relate only to the sample received.
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request
Unless otherwise stated, sample information has been provided by the client. This may affect the validity of the results.

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage