

# **PRELIMINARY RISK ASSESSMENT FOR LAND AT WYNNSTAY TECHNOLOGY PARK, RUABON**

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## **EXECUTIVE SUMMARY**

### **Introduction**

Preliminary Risk Assessment of Land at Wynnstay Technology Park, Ruabon, LL14 6EN. The purpose of the investigation was to determine the environmental setting of the Site, undertake a desk based shallow coal mining risk assessment and determine potential contaminant linkages associated with the proposed development.

### **Site location**

The Site is located at Wynnstay Technology Park, Ruabon, LL14 6EN, approximately 1km west of Ruabon town centre.

### **Site history**

At the time of the earliest available mapping of 1873, the majority of the Site was undeveloped. An air shaft was shown within the southern part of the Site and a stream flowed through the Site from north to south. By 1910 the Site and surrounding land was re-graded with arisings from Wynnstay Colliery. By 1981 the site formed part of Wynnstay Technology Park with commercial/industrial units subsequently developed to the east and south of the Site and residential housing comprising Plas Madoc to the west of the Site.

### **Probable Ground conditions**

Ground conditions are anticipated to include Made Ground derived predominantly of mudstone, coal and sandstone, overlying Glaciofluvial Deposits (Unproductive Strata) comprising sand and gravel to a depth of approximately 14.2m bgl. Bedrock of the Lower Coal Measures (Secondary A Aquifer) comprises sandstone and mudstone. The shallowest coal seams are anticipated from a depth of approximately 52m bgl and are not considered to present a potential risk to the proposed development.

### **Ground stability**

A treated and capped air shaft is located within the Site. In March 1990 Wrexham Maelor Borough Council provided information that they had treated and capped (121.15m AOD) this shaft in accordance with British Coal recommendations. Based on the recorded geology beneath the Site and the Coal Authority information, the potential for coal mining to impact upon the proposed development has been discounted due to the depth of the recorded coal deposits and the treatment of the on-site shaft.

## **Hydrology**

The nearest surface water receptor to the Site is an unnamed stream which flows from north to south and enters a culvert 35m north of the Site which runs down , before emerging 470m south of the Site. There are no licences surface water abstractions within 1km of the Site. The risk to surface water receptors has been discounted due to the distance to the open water courses. Hydrogeology The Site is indicated to be underlain by natural strata comprising Glaciofluvial Deposits to a depth of 14.2m bgl and bedrock of the Lower Coal Measures (Secondary A Aquifer) extending to considerable depth. The Site is not located within a groundwater Source Protection Zone and there are no licensed abstractions within 500m of the Site. Given the low sensitivity and the recorded Site history, the Site is not considered to present a significant risk to groundwater receptors.

## **Potential Soil Contamination**

There is the potential for contaminants associated with Made Ground present beneath the Site; however, the potential risk to the proposed development is considered to be low. Potential for Gas protection Whilst the potential for ground gas associated with on-site and off-site Made Ground cannot be discounted, the risk to users of the future development is considered to be low as the implementation of control measures, such as inclusion of gas protection measures within the development is, if required, readily achievable.

## **Radon**

The Site is in an area where radon protection measures are required.

## **1. INTRODUCTION**

Phase I Preliminary Risk Assessment of land at Wynnstay Technology Park, (the “Site”) located at Ruabon, LL14 6EN. The Site is located within Wynnstay Technology Park approximately 1km west of Ruabon Town Centre. The Site is proposed for development as residential land use.

Taking into account the planned future use of the Site, the objectives of this appraisal were:

- To determine the land use history from review of available historical documentation and maps.
- To establish the environmental setting of the Site.
- To determine the likely soil and groundwater conditions, including whether significant contamination could have resulted from past or current land use(s).
- To determine the potential risks posed by any ground contamination.
- To determine the potential for risks posed to the Site from hazardous ground gases.
- To evaluate whether past mining or other extractive industries could have an influence on the Site.

The desk-study part of this investigation included the assessment of information provided by Groundsure, the Coal Authority and the British Geological Survey (BGS). The information provided by these organisations is provided in Appendix F.

This report, which was designed to meet the requirements of all relevant current guidance including the remaining CLR reports, presents the factual information available during this appraisal, interpretation of the data obtained and recommendations relevant to the defined objectives.

It has been assumed in the production of this report that the Site is to be developed as residential land use. In addition, it is assumed that ground levels will not change significantly from those described in this report. If this is not the case, then amendments to the recommendations made in this report may be required.

Where the report refers to the potential presence of invasive plants (such as Japanese Knotweed) or asbestos-containing materials, such observations are for information only and should be verified by a suitably qualified expert.

The comments and opinions presented in this report are based on the findings of the desk study. There may be other conditions prevailing on the Site which have not been revealed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for any conditions not revealed by this investigation. Any diagram or opinion on the possible configuration of the findings is conjectural and given for guidance only. Confirmation of intermediate ground conditions should be undertaken if deemed necessary.

## **2. SITE DETAILS AND DESCRIPTION**

### **Current Site Overview.**

Site name - Land at Wynnstay Technology Park

Site address - Wynnstay Technology Park, Ruabon, Wrexham, LL14 6EN. A site location plan is included as Drawing No. T/16/1794/PRA/1 within Appendix A.

National Grid Reference - 329208,343589

Location description - The Site is located within Wynnstay Technology Park, approximately 1km west of Ruabon Town Centre.

Approximate Site area - 1.7ha

Site shape - The Site is broadly rectangular.

General topography and ground levels - The majority of the Site is generally flat lying at an approximate elevation of 125m AOD. Embankments are present along the western and northern boundaries of the Site.

Current land use - The Site is currently vacant.

Existing structures - No above ground structures were noted during the Site walkover undertaken on 1st June 2019.

Site ground surfaces - The Site is ostensibly surfaced with gravel of mudstone, sandstone and rare brick and concrete. Localised areas of trees, small shrubs and rough scrub were present as localised areas within the Site and along the western and northern Site boundaries.

Sub-surface structures - Sub surface structures include the treated on-site air shaft, the cap of which is reported at an elevation of 121.15m AOD.

Invasive plant species - None were noted during the Site walkover; however, this should be confirmed through a specialist ecological survey.

The main Site features are shown on Drawing No. 18/1786/03 within Appendix A. Relevant Site photographs are presented in Appendix C.

### 3. ENVIRONMENTAL SETTING

#### 3.1. Site History

Extracts of Ordnance Survey (OS) plans dated from 1873 to 2014 were reviewed. These were obtained as part of the GroundSure report for the Site, which is presented in Appendix F.

Table 3.1 presents a summary of the main aspects of the Site from 1873 - 2014 relevant to the current and proposed future end uses. It is not the intention of this report to describe in detail all of the changes that have occurred on or adjacent to the Site, where these are not relevant to the land use.

Table 3.1. Site History.

| Source (Map edition, scale)       | On-Site features                                                                                                                                                                                                                                                                                                  | Off-Site features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1873, 1:2,500 and 1:10,560        | <ul style="list-style-type: none"><li>• A shaft surrounded by a small mound is shown within the central southern area of the Site.</li><li>• A small unlabelled building and chimney are shown to the northeast of the mound.</li><li>• A stream is shown flowing from north to south through the Site.</li></ul> | <ul style="list-style-type: none"><li>• A road is shown adjoining the northern and western boundaries of the Site.</li><li>• A railway is shown 10m west of the Site.</li><li>• Wynnstay Colliery is shown beyond 150m south of the Site with extensive railway sidings, structures and shafts noted.</li><li>• A Brick Works and kilns is shown beyond 500m northwest of the Site with brick pits located beyond 400m northwest of the Site.</li><li>• The New British Iron Works is shown beyond 750m southwest of the Site.</li></ul> |
| 1899, 1:2,500 and 1900, 1:10,560. | <ul style="list-style-type: none"><li>• No significant changes.</li></ul>                                                                                                                                                                                                                                         | <ul style="list-style-type: none"><li>• Land to the immediate south of the Site comprises a spoil tip associated with Wynnstay Colliery.</li><li>• An old quarry is shown beyond 110m east of the Site.</li></ul>                                                                                                                                                                                                                                                                                                                        |
| 1910, 1:10,560 and 1912, 1:2,500. | <ul style="list-style-type: none"><li>• A tramway extends into the Site from Wynnstay Colliery and the north western area of the Site has been subject to regrading with colliery spoil.</li></ul>                                                                                                                | <ul style="list-style-type: none"><li>• Further tipping of colliery spoil has taken place towards the east and south of the Site and includes infilling of the small 'old quarry' 110m east of the Site.</li><li>• The brick works to the northwest of the Site is shown to be disused.</li></ul>                                                                                                                                                                                                                                        |
| 1938, 1:10,560                    | <ul style="list-style-type: none"><li>• No significant changes.</li></ul>                                                                                                                                                                                                                                         | <ul style="list-style-type: none"><li>• No significant changes.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1949, 1:10,560                    | <ul style="list-style-type: none"><li>• No significant changes.</li></ul>                                                                                                                                                                                                                                         | <ul style="list-style-type: none"><li>• No significant changes.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                   |                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1960, 1:10,560 and 1961, 1:2,500. | <ul style="list-style-type: none"> <li>The on-site tramway is no longer shown; the air shaft is shown as disused.</li> </ul>                            | <ul style="list-style-type: none"> <li>The railway to the west of the Site is no longer shown; the embankments remain. The Wynnstay Colliery is shown as disused.</li> </ul>                                                                                                                                                                  |
| 1967, 1:2,500.                    | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                                                                                                                                                                                                                     |
| 1971, 1:2,500 and 1977, 1:10,000  | <ul style="list-style-type: none"> <li>The on-site 'disused shaft' is no longer shown. The Site is shown as comprising a level area of land.</li> </ul> | <ul style="list-style-type: none"> <li>Land to the west of the Site has been developed as residential housing.</li> </ul>                                                                                                                                                                                                                     |
| 1985, 1:10,000                    | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                                                                                                                                                                                                                     |
| 1989, 1:2,500                     | <ul style="list-style-type: none"> <li>The Site remains undeveloped with embankments along the northern and western boundaries of the Site.</li> </ul>  | <ul style="list-style-type: none"> <li>The road to the north of the Site appears to have been improved.</li> <li>An unspecified commercial/industrial building with an electrical substation and unspecified tank is shown 20m from the eastern Site boundary; the tank and substation are 30m and 80m from the Site respectively.</li> </ul> |
| 1991, 1:2,500                     | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>An unspecified commercial/industrial building is shown 10m south of the Site.</li> </ul>                                                                                                                                                                                                               |
| 1994, 1:2,500 and 1:10,000        | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                                                                                                                                                                                                                     |
| 2002, 1:10,000                    | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                                                                                                                                                                                                                     |
| 2010, 1:10,000                    | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                                                                                                                                                                                                                     |
| 2014, 1:10,000                    | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>No significant changes.</li> </ul>                                                                                                                                                                                                                                                                     |

### 3.2. Geology

Table 3.2. Geological Summary.

|                                  |                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maps and publications referenced | Groundsure Report, Coal Authority Report and BGS log SJ24/44 of the air shaft located within the Site.                                                                                                                                                                                                                           |
| Made ground                      | The Site is not indicated to be underlain by Made Ground; however, the historical mapping and site walkover indicates Made Ground is present at the Site. Made Ground was observed to comprise clayey sandy cobbly gravel comprising mudstone, sandstone, coal and locally anthropogenic materials including brick and concrete. |
| Drift geology                    | The Site is shown to be underlain by Glaciofluvial Deposits comprising sand and gravel. The on-site borehole log records superficial deposits of 'Glacial Drift' comprising 'sand and gravel' to a depth of 14.2m bgl (109.6m AOD).                                                                                              |
| Solid geology                    | Bedrock of the Lower Coal Measures is anticipated at a depth of approximately 14.2m bgl and comprises blue and grey mudstone and fine sandstone/siltstone with coal encountered at 52m bgl.                                                                                                                                      |
| Dip of solid strata              | Not established.                                                                                                                                                                                                                                                                                                                 |

|            |                                                                                                                                                                                                                                                                                                                        |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Faults     | 2 No. faults striking northeast/southwest are shown within the Site. The dip and offset of the faults is not known. Given the thickness of the overlying superficial deposits, the faults are not considered to present a significant risk to the proposed development.                                                |
| Coal seams | The on-site borehole log SJ24/44 records the shallowest coal seam at a depth of 52m bgl with a thickness of 0.30m. A deeper coal seam is recorded at 55.8m bgl with a thickness of 1.21m. Given the depth and thickness of the coal seams there is not considered to be a risk of void migration impacting at surface. |

### 3.3. Mining and Quarrying

A disused air shaft is shown within the Site and the Site is underlain by coal measures strata anticipated at a depth of approximately 14.2m bgl. A Coal Authority Non-Residential Mining Report ordered for the Site reports the following:

- The property is in a surface area that could be affected by underground mining in 6 seams of coal at 140m to 320m depth, and last worked in 1927. Any movement in the ground due to coal mining activity should have stopped.
- A decommissioned and treated air shaft, Coal Authority reference No. 329343-194 is located within the Site. In March 1990 Wrexham Maelor Borough Council provided information that they had treated and capped this shaft in accordance with British Coal recommendations. They state that 515 tonne of 9:1 PFA/OPC grout was pressure injected into the shaft fill. The shaft was then covered with a 9.6m X 9.6m X 600mm thick reinforced concrete cap situated in competent clay some 2.6m BGL. Level of top of cap is 121.15m AOD. The shaft was conveyed to Tsuda (UK) Co. Ltd in 1991.

The Coal Authority Website interactive map viewer indicates that the Site is not located in an area potentially affected by shallow coal workings and the Site does not lie within a development high risk area, with the exception of the air shaft which is recorded as having been treated and capped.

Based on the recorded geology beneath the Site and the Coal Authority information, the potential for coal mining to impact upon the proposed development has been discounted due to the depth of the recorded coal deposits and the treatment of the on-site shaft. Notwithstanding this, it is recommended that buildings or structures are not positioned directly over the decommissioned air shaft.

Table 3.3. Other Extractive Industries.

|                                                        | Yes/No | Comments                                                                                                                        |
|--------------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------|
| Superficial drift deposits                             |        |                                                                                                                                 |
| Evidence of extraction on or within 250 m of the Site? | Yes    | Localised quarrying of superficial deposits 110m east of the Site.                                                              |
| Action required?                                       | No     | Due to the scale of the extraction and distance from the Site, these industries would not impact upon the proposed development. |

Other, undocumented mineral workings on or close to the Site cannot be completely dismissed.

### 3.4. Hydrogeology

Table 3.4. Groundwater Occurrence and Abstraction.

|                         | Presence/location | Comments                                                                                                      |
|-------------------------|-------------------|---------------------------------------------------------------------------------------------------------------|
| Depth(s)                | On-Site           | Superficial deposits are designated as Unproductive Strata. Bedrock is designated as a Secondary (A) Aquifer. |
| Direction of flow       | Not established   |                                                                                                               |
| Licensed abstractions   | NR                |                                                                                                               |
| Private wells           | NR                |                                                                                                               |
| Source Protection Zones | NR                |                                                                                                               |
| Springs                 | NR                |                                                                                                               |

NR - none recorded. For definition of Source Protection Zones, see Appendix D.

### 3.5. Hydrology

Table 3.5. Surface Water Features.

|                                                | Presence/location      | Comments                                                                                                                              |
|------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Environment Agency GQA classified watercourses | NR                     |                                                                                                                                       |
| Unclassified watercourse(s)                    | 35m north of the Site. | A Tertiary River is shown running north to south and entering a culvert 35m north of the Site before emerging 470m south of the Site. |
| Licensed abstractions                          | NR                     |                                                                                                                                       |
| Canals, ponds, lakes, etc.                     | NR                     |                                                                                                                                       |
| Flood risk status                              | NR                     |                                                                                                                                       |
| Surface run-off and Site drainage              | On-Site                | The Site is open ground and currently drains via infiltration.                                                                        |

NR - none recorded

Environment Agency GQA assessments: A = very good to E = poor

### 3.6. Ecological Features

Table 3.6. Ecological Features.

|                           | Presence/location | Comments                                                                                                                 |
|---------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------|
| Designated locations      | NR                |                                                                                                                          |
| Other sensitive locations | NR                |                                                                                                                          |
| Land use controls         | NR                |                                                                                                                          |
| Invasive plants           | NR                | A survey by a qualified invasive plant consultant is required to confirm the absence or extent of invasive species.      |
| Trees and shrubs          | On-site           | During the site walkover, semi mature trees and shrubs were noted along the northern and western boundaries of the Site. |

NR - none recorded

### 3.7. Landfill and Waste Management Activity

Table 3.7. Waste Management Activities.

|                                                                  | Presence/location | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Local authority recorded landfills                               | NR                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| BGS recorded landfills                                           | NR                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Other licensed waste management facilities within 250 m          | NR                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Is there evidence of other infilling on or within 250 m of Site? | Yes               | Colliery spoil was placed across the Site prior to 1910. The Site was subsequently re-graded as part of the redevelopment of the Site as Wynnstay Technology Park prior to 1971.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Is a landfill/ground gas risk assessment required?               | Yes               | Made Ground is anticipated beneath the Site from historic mapping and the site walkover and was observed to comprise mudstone, sandstone, coal and occasional anthropogenic material. The potential for gas generation from the on-site Made Ground is considered to be low as the degradation of mudstone and coal are 'generally not readily degradable so produce no more than low volumes per unit time of methane or carbon dioxide' (Annex D of BS 8485:2015). Furthermore, given the time since the material was placed, the potential for the Made Ground to present a significant ongoing source of ground gas is considered to be low. |

NR - none recorded

### 3.8. Local Potentially Contaminative Activities

Other potentially contaminative activities are shown in Table 3.8. The entries relate to activities within circa 250 m of the Site, with the exception of COMAH facilities where the assessment is extended to a distance of circa 1 km from the Site.

Table 3.8. Other Potentially Contaminative Processes in the Locality.

|                                                           | Location | Comments |
|-----------------------------------------------------------|----------|----------|
| Discharge Consents                                        | NR       |          |
| Prosecutions relating to controlled waters                | NR       |          |
| Substantiated pollution incidents                         | NR       |          |
| IPPC permits/air pollution controls                       | NR       |          |
| Registered radioactive substances                         | NR       |          |
| Prosecutions relating to authorised processes             | NR       |          |
| Enforcement and prohibition notices                       | NR       |          |
| Planning - hazardous substances consents and enforcements | NR       |          |
| COMAH sites                                               | NR       |          |
| NIHHS sites                                               | NR       |          |
| Fuel station entries                                      | NR       |          |

NR - none recorded

COMAH – Control of Major Accident Hazards (regulations); NIHHS – Notification of Installations Handling Hazardous Substances (regulations)

### 3.9. Radon Risk

Table 3.9. Radon Risk Status.

|                          | Radon protection measures required? (Yes/No) | Comments                                                                                                                                  |
|--------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| BRE (1999), Report 211   | Yes                                          | The Site is located in an area where between 3% and 5% of homes are above the Action Level. Basic radon protection measures are required. |
| BGS Site-specific report | Not requested                                |                                                                                                                                           |

#### **4. PREVIOUS INVESTIGATION FINDINGS**

No previous desk study or site investigation reports pertaining to this Site have been made available.

#### **5. PROPOSED DEVELOPMENT**

It is understood that the Site is to be developed as residential with plant uptake land uses.

The proposed layout of the Site is presented in Appendix A to this report.

## **6. PRELIMINARY CONCEPTUAL MODEL**

Based on the desk study, a combined preliminary conceptual site model and conceptual exposure model has been developed for the proposed future land use. This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors. In assessing the likely contaminants present at the Site, reference has also been made to Defra and Environment Agency supporting documentation. A preliminary qualitative risk assessment has also been made of the likelihood of the linkage operating and its potential significance.

The potential pollutant linkages identified and the qualitative risk assessment for these are presented in Table 6.1. The terms used in the preliminary qualitative risk assessment are defined in Appendix E.

### **6.1. Justification**

The following factors are considered pertinent in defining the conceptual model.

#### **Land Use**

- The Site is currently vacant land proposed for development as commercial and residential with gardens land use. It is understood that the site levels will not change markedly from the current levels, although it is anticipated that under current proposals the embankment along the western Site boundary of the Site will require local removal to facilitate access.
- At the time of the earliest available mapping of 1873, the majority of the Site was undeveloped. An air shaft was shown within the southern part of the Site and a stream flowed through the Site from north to south. By 1910 the Site and surrounding land was re-graded with arisings from Wynnstay Colliery. By 1981 the site formed part of Wynnstay Technology Park with commercial/industrial units subsequently developed to the east and south of the Site and residential housing comprising Plas Madoc was present to the west of the Site.
- The Site and surrounding land is directly underlain by Made Ground derived from colliery spoil which has been re-graded with off-site development including commercial/industrial and residential properties.

- The Site is shown to be underlain by Glaciofluvial Deposits (Unproductive Strata) comprising sand and gravel to a depth of approximately 14.2m bgl overlying bedrock of Lower Coal Measures (Secondary (A) Aquifer). Given the low sensitivity of the underlying controlled waters, the Site is not considered to present a potentially significant risk to controlled waters receptors. Furthermore, the on-site air shaft is reported as decommissioned and treated; as such, this is not considered to present a potential pathway for groundwater migration to the underlying bedrock.
- Bedrock of Lower Coal Measures comprises mudstone and siltstone with the shallowest coal seams reported at a depth of approximately 52m bgl. The Coal Authority report states that the shallowest recorded coal workings are at 140m to 320m depth. Given the thickness and depth, historic coal workings beneath the Site are not considered to present a significant risk to the proposed.
- The nearest surface water receptor is tertiary stream flowing north to south which enters a culvert 35m north of the Site. Given the flow direction and the culverted nature of the water course in the vicinity of the Site, surface water receptors have been discounted as a potential receptor.
- The potential for on-site and off-site Made Ground to present a significant source of ground gas is considered to be low due to the anticipated low degradation potential of the Made Ground within and out with the Site and the time since the Made Ground was re-graded as part of the development of Wynnstay Technology Park.
- On-site and off-site Made Ground is considered to be derived from colliery spoil and may present a potential source of ground gas, PAHs, metals and sulphates. The Made Ground includes localised evidence of demolition rubble (bricks and concrete); the presence of asbestos cannot be discounted. The effects of such contaminants, if present, with respect to the proposed development is considered to be manageable through the implementation of control measures. As such, the severity of the impact is considered to be mild.

## **Potential Sources**

- On-Site Made Ground (PAHs, metals, asbestos, sulphate).
- Off-site Made Ground and coal measures (bulk ground gas).

## **Potential Pathways**

- Dermal contact, ingestion and inhalation of contaminants on-site.
- Migration of ground gas / explosion.
- Migration of mobile contaminants from Made Ground soils to adjacent sites along services and conduits.
- Contaminated dust migration during construction.
- Migration via water pipes.

## **Potential Receptors**

- Future users of the Site and adjacent land.
- Buildings, hardstanding and services.
- Site investigation, demolition and construction staff and future underground service maintenance workers from hazardous short term exposure.

## **6.2. Uncertainties**

The following uncertainties exist in the preliminary conceptual model:

- The presence of any features unrecorded by the historical maps.
- Any unrecorded geological features.
- The current nature of the ground conditions following re-grading of the Site.
- Any unreported pollution events during the site's history.

Table 6.1. Preliminary Assessment of Potential Pollutant Linkages.

| Pollutant linkage |                                                                                              |                                                                                                                                                         |                                                                                                                                              | Generic quantitative risk assessment |
|-------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
|                   | Source                                                                                       | Pathway(s)                                                                                                                                              | Receptor(s)                                                                                                                                  |                                      |
| 1                 | Possible metal, PAH, sulphate and asbestos                                                   | Inhalation of vaporous contaminants.                                                                                                                    | Future users of the Site. (residential)                                                                                                      | Mild x Low Likelihood = Low risk     |
| 2                 | contamination of on-site Made Ground from previous Site uses.                                | Dermal contact and ingestion of contaminants. Contaminated dust migration during construction.                                                          | Site investigation, demolition and construction staff and future underground service maintenance workers from hazardous short term exposure. | Mild x Low Likelihood = Low risk     |
| 3                 |                                                                                              | Contaminated dust migration during construction. Migration of mobile contaminants from Made Ground soils to adjacent sites along services and conduits. | Adjacent users of the Site.                                                                                                                  | Mild x Low Likelihood = Low risk     |
| 4                 |                                                                                              | Migration via water pipes.                                                                                                                              | Future users of the Site.                                                                                                                    | Mild x Low Likelihood = Low risk     |
| 5                 | Bulk ground gas generation from coal seams at depth, on-site and off-site Made Ground soils. | Migration of ground gas / explosion.                                                                                                                    | Buildings, hardstanding and services. Future users of the Site. (residential)                                                                | Mild x Low Likelihood = Low risk     |

For definition of the terms used in the qualitative risk assessment, please see Appendix E

## **7. REGULATORY APPROVALS**

The conclusions and recommendations presented above are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and, therefore, the report should be passed to the appropriate regulatory authorities and/or other organisations for their comment and approval prior to undertaking any works on site.

It is recommended that conditions placed on any planning permission are discharged prior to commencement of site works.

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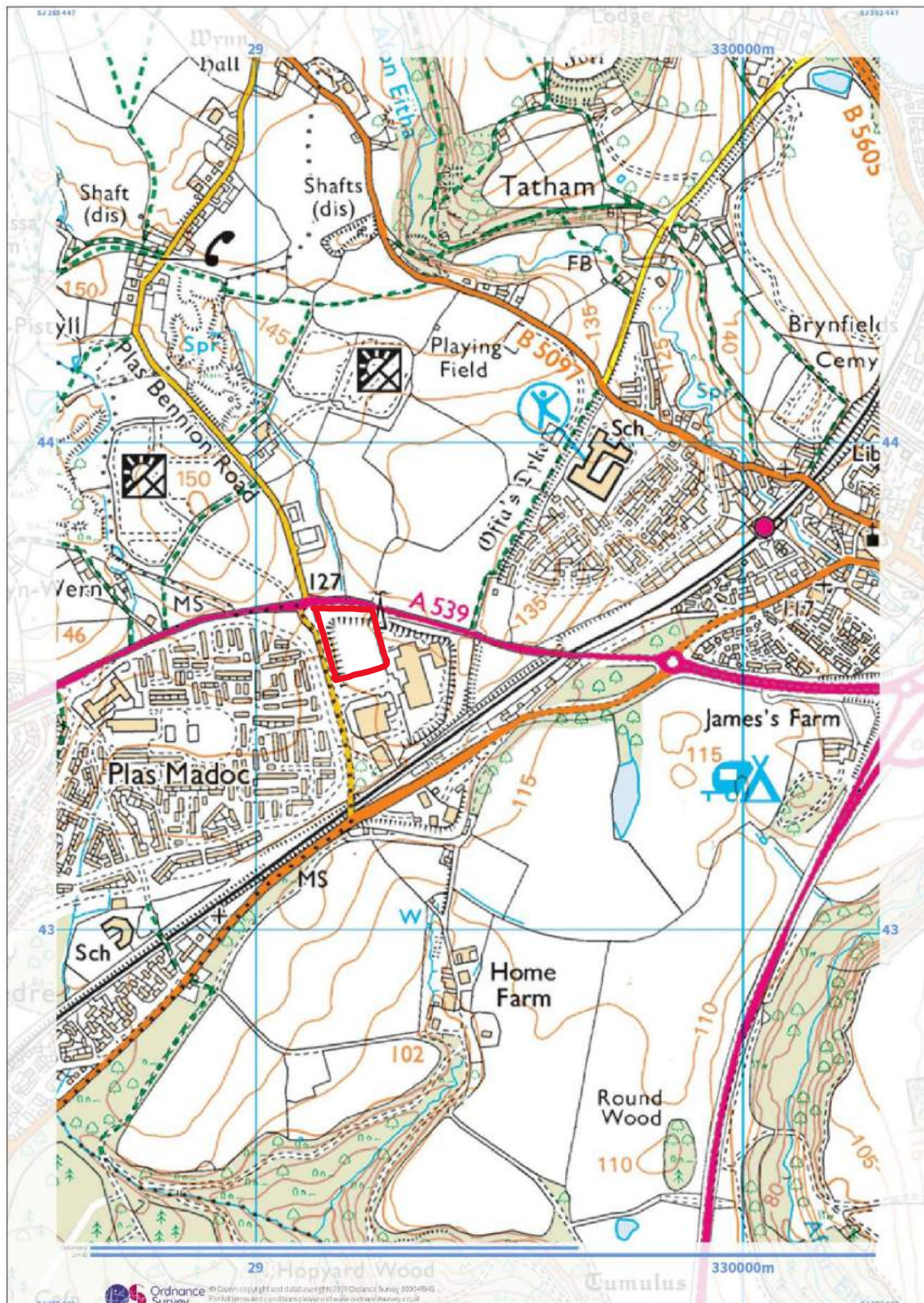
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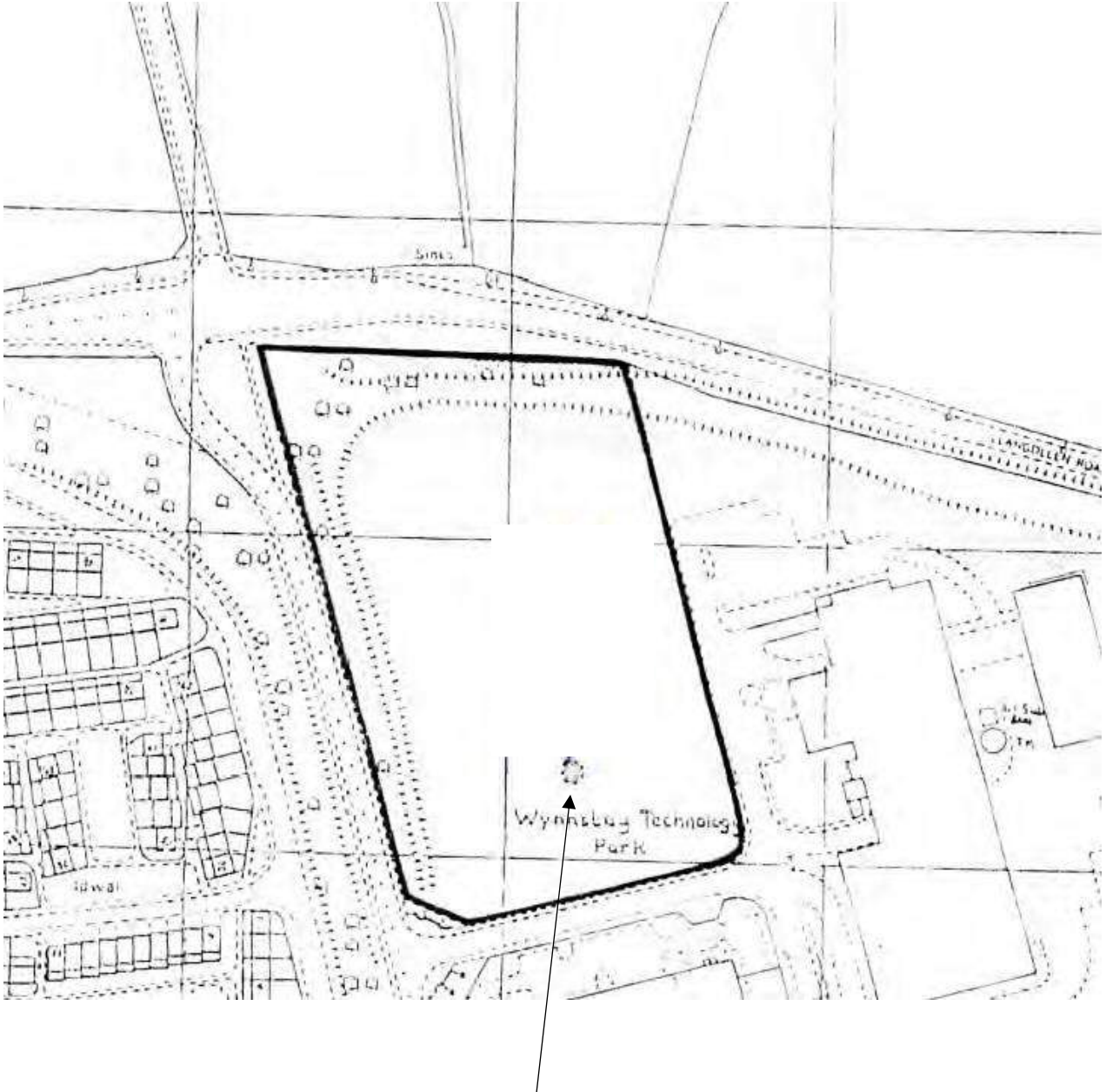
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## **APPENDIX A – FIGURES AND DRAWINGS**

## Site Location Plan



## Exploratory Hole Location



Treated Air Shaft (Approximate Location)

## Proposed Block Plan



## APPENDIX B – GLOSSARY OF TERMS

|                     |                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ACEC                | Aggressive Chemical Environment for Concrete (classification)                                                                                                                                                                                                                                                                                                                        |
| aOD                 | Above Ordnance Datum                                                                                                                                                                                                                                                                                                                                                                 |
| bgl                 | Below ground level                                                                                                                                                                                                                                                                                                                                                                   |
| BGS                 | British Geological Survey                                                                                                                                                                                                                                                                                                                                                            |
| BRE                 | Building Research Establishment                                                                                                                                                                                                                                                                                                                                                      |
| CBR                 | California Bearing Ratio (test)                                                                                                                                                                                                                                                                                                                                                      |
| COMAH               | Control of Major Accident Hazards (regulations)                                                                                                                                                                                                                                                                                                                                      |
| Designated location | Site (and the ecosystem on that site) protected under national or international legislation. A potential ecological receptor to be considered as part of the assessment of land contamination. Example designated locations include SSSIs (q.v.), SACs (q.v.), national nature reserves, Ramsar sites and bird special protection areas.                                             |
| DQA                 | Data Quality Assessment                                                                                                                                                                                                                                                                                                                                                              |
| DQO                 | Data Quality Objective                                                                                                                                                                                                                                                                                                                                                               |
| DQRA                | Detailed Quantitative Risk Assessment                                                                                                                                                                                                                                                                                                                                                |
| DWS                 | Drinking Water Standard                                                                                                                                                                                                                                                                                                                                                              |
| EQS                 | Environmental Quality Standard                                                                                                                                                                                                                                                                                                                                                       |
| GAC                 | Generic Assessment Criterion                                                                                                                                                                                                                                                                                                                                                         |
| GQA                 | General Quality Assessment (Environment Agency)                                                                                                                                                                                                                                                                                                                                      |
| GSV                 | Gas Screening Value                                                                                                                                                                                                                                                                                                                                                                  |
| HCV                 | Health Criteria Value                                                                                                                                                                                                                                                                                                                                                                |
| IPPC                | Integrated Pollution Prevention and Control (regulations)                                                                                                                                                                                                                                                                                                                            |
| KOW                 | Octanol-water partition coefficient                                                                                                                                                                                                                                                                                                                                                  |
| LEL                 | Lower Explosive Limit                                                                                                                                                                                                                                                                                                                                                                |
| LL                  | Liquid Limit                                                                                                                                                                                                                                                                                                                                                                         |
| LoD                 | Limit of Detection (analytical)                                                                                                                                                                                                                                                                                                                                                      |
| LoQ                 | Limit of Quantification (analytical)                                                                                                                                                                                                                                                                                                                                                 |
| Mean Value Test     | Statistical test (described in CLR7) to estimate the mean value of a normally distributed population of data at a given level of confidence. Normally for contaminated land assessment, the 95th percentile (referred to as the 95%UCL or US95) is applied as a reasonable but conservative estimate of the mean concentration for comparison with the relevant assessment criteria. |
| Maximum Value Test  | Statistical test (described in CLR7) to identify whether an elevated concentration within a normally distributed data set forms part of the underlying population from which it has been sampled or whether it is an outlier (such as a localised area of contamination) that merits further consideration.                                                                          |
| MC                  | Moisture Content                                                                                                                                                                                                                                                                                                                                                                     |
| NGR                 | National Grid Reference                                                                                                                                                                                                                                                                                                                                                              |
| NIHHS               | Notification of Installations Handling Hazardous Substances (regulations)                                                                                                                                                                                                                                                                                                            |
| OS                  | Ordnance Survey                                                                                                                                                                                                                                                                                                                                                                      |
| PI                  | Plasticity Index                                                                                                                                                                                                                                                                                                                                                                     |
| PID                 | Photoionisation Detector                                                                                                                                                                                                                                                                                                                                                             |
| PL                  | Plastic Limit                                                                                                                                                                                                                                                                                                                                                                        |
| ppm                 | Parts per million                                                                                                                                                                                                                                                                                                                                                                    |

|      |                                                                                              |
|------|----------------------------------------------------------------------------------------------|
| ppmv | Parts per million by volume                                                                  |
| QA   | Quality Assurance                                                                            |
| QC   | Quality Control                                                                              |
| SAC  | Special Area of Conservation                                                                 |
| SOM  | Soil Organic Matter                                                                          |
| SPT  | Standard Penetration Test                                                                    |
| SPZ  | Source Protection Zone (see Appendix E)                                                      |
| SSAC | Site-Specific Assessment Criterion                                                           |
| SSSI | Site of Special Scientific Interest                                                          |
| SVOC | Semi-Volatile Organic Compound                                                               |
| TEF  | Toxicity Equivalent Factor                                                                   |
| TPH  | Total Petroleum Hydrocarbons                                                                 |
| TWA  | Time Weighted Average                                                                        |
| US95 | 95th percentile estimate of the true mean value of a data population (also known as 95%UCL). |
| VOC  | Volatile Organic Compound                                                                    |

## APPENDIX C – PHOTOGRAPHS TAKEN DURING SITE WALKOVER

Photo 1: General view of the Site looking north



Photo 2: View of vegetated areas towards the north and northwest of the Site



Photo 3: View looking south over the Site from the top of the embankment along the northern Site boundary



## APPENDIX D – DEFINITION OF SOURCE PROTECTION ZONES AND GROUNDWATER VULNERABILITY ASSESSMENTS

### Source Protection Zones

Source Protection Zones (SPZs) are defined by the Environment Agency (for England and Wales), SEPA (Scotland) and the Environment and Heritage Service (Northern Ireland) for groundwater sources such as wells, boreholes and springs that are used for public drinking water supply. The zones show the risk of contamination from activities that might cause groundwater pollution in the area. The size and shape of a zone depends upon subsurface conditions, how the groundwater is removed, and other environmental factors.

SPZs are classified into four categories:

- Zone 1 (Inner protection zone). Any pollution that can travel to the abstraction point within 50 days from any point within the zone is classified as being inside Zone 1. This applies at and below the groundwater table. This zone also has a minimum 50 m protection radius around the abstraction point. These criteria are designed to protect against the transmission of toxic chemicals and water-borne disease.
- Zone 2 (Outer protection zone). The outer zone covers pollution that takes up to 400 days to travel to the abstraction point, or 25% of the total catchment area, whichever area is the largest. This travel time is the minimum period over which the Environment Agency considers that pollutants need to be diluted, reduced in strength or delayed by the time they reach the abstraction point.
- Zone 3 (Total catchment). This is the total area needed to support removal of water from the abstraction point, and to support any discharge from this.
- Zone of special interest. This may occasionally be defined as a special case. This is usually where local conditions mean that industrial sites and other potential sources of contamination could affect the groundwater source, even though they are outside the normal catchment area.

### Groundwater Vulnerability Assessments

From 1 April 2010 The Environment Agency Groundwater Protection Policy began to use aquifer designations which are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

The aquifer designation data is based on geological mapping provided by the British Geological Survey. It is updated regularly to reflect their ongoing programme of improvements to these maps. The maps are split into two different type of aquifer designation:

- Superficial (Drift) - permeable unconsolidated (loose) deposits. For example, sands and gravels.
- Bedrock -solid permeable formations e.g. sandstone, chalk and limestone.

The maps display the following aquifer designations:

Table 1. Aquifer Classification (“Geological Classification”).

| Classification                        | Definition                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Principal Aquifers (Highly Permeable) | These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer. |
| Secondary A Aquifers                  | 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                                                                                               |
| Secondary B Aquifers                  | Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers                                                                          |
| Secondary Undifferentiated Aquifers   | This has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.                    |
| Unproductive Strata                   | These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.                                                                                                                                                                                                 |

## APPENDIX E – DEFINITIONS OF TERMS USED IN QUALITATIVE AND QUANTITATIVE RISK ASSESSMENTS

For the qualitative and quantitative assessment of risks posed by potential pollutant linkages have been undertaken using the risk matrix adapted from CIRIA C552 and outlined in the table below.

|                     | Category        | Definition                                                                                                                                                                                   |
|---------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Potential severity  | Severe          | Acute (short term) risk to human health, Major pollution of sensitive controlled waters, ecosystems or habitat. Catastrophic damage to buildings or property or crops.                       |
|                     | Medium          | Chronic (Medium / long term) risk to human health Pollution of sensitive controlled waters, ecosystems or species, Significant damage to crops, buildings or structures                      |
|                     | Mild            | Easily preventable permanent health effects on humans. Pollution of non-sensitive controlled waters. Minor damage to buildings or structures.                                                |
|                     | Minor           | Easily preventable non-permanent health effects on humans, or no effects. Minor, low level and localised contamination of on-site soil. Easily repairable damage to buildings or structures. |
| Probability of risk | High Likelihood | Pollutant linkage may be present and the risk is almost certain to occur , or there is evidence of harm already occurring.                                                                   |
|                     | Likely          | Pollutant linkage may be present and it is probable that the risk will occur over the long term.                                                                                             |
|                     | Low Likelihood  | Pollutant linkages may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.                                                       |
|                     | Unlikely        | Pollutant linkage may be present but the circumstances under which harm would occur are improbable.                                                                                          |

|                     |                 | Potential Severity |              |              |              |
|---------------------|-----------------|--------------------|--------------|--------------|--------------|
|                     |                 | Severe             | Medium       | Mild         | Minor        |
| Probability of risk | High Likelihood | Very high          | High         | Moderate     | Moderate/Low |
|                     | Likely          | High               | Moderate     | Moderate/Low | Low          |
|                     | Low Likelihood  | Moderate           | Moderate/Low | Low          | Negligible   |
|                     | Unlikely        | Moderate/Low       | Low          | Negligible   | Negligible   |

## **APPENDIX F – MINING AND GROUNDSURE REPORTS**



The Coal  
Authority

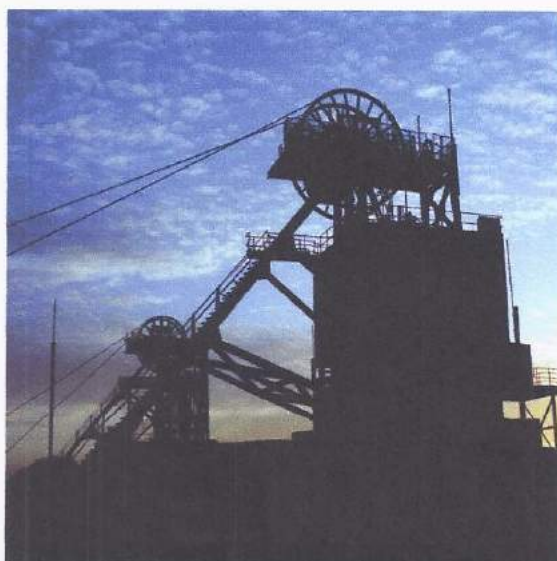
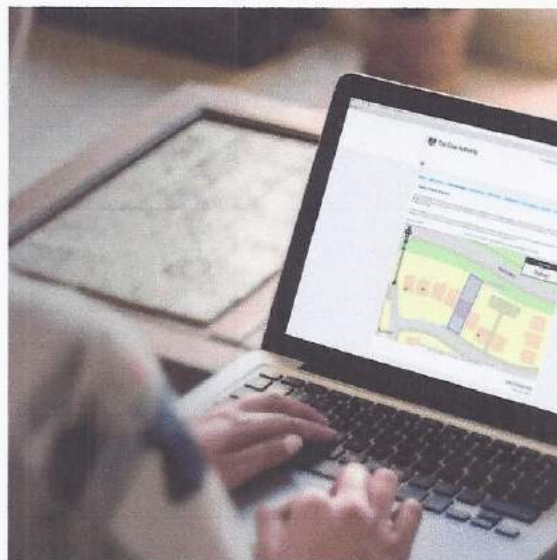
Resolving the **impacts** of mining

# CON29M Non-Residential Mining Report

LAND AT WYNNSTAY  
TECHNOLOGY PARK  
RUABON  
WREXHAM  
LL14 6EN

Date of enquiry: 30 November 2018  
Date enquiry received: 30 November 2018  
Issue date: 30 November 2018

Our reference: 61002370720001  
Your reference: WFC:GRA221/3



# CON29M Non-Residential Mining Report

This report is based on, and limited to, the records held by the Coal Authority, at the time we answer the search.

## Client name

SearchFlow Limited

## Enquiry address

LAND AT WYNNSTAY, TECHNOLOGY PARK,  
RUABON, WREXHAM, LL14 6EN

## How to contact us

0345 762 6848 (UK)  
+44 (0)1623 637 000 (International)

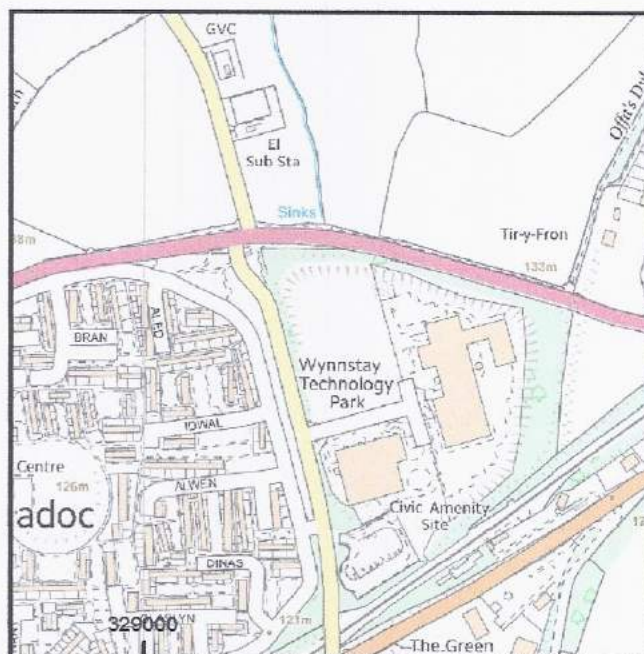
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Mansfield  
Nottinghamshire  
NG18 4RG

[www.groundstability.com](http://www.groundstability.com)

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Approximate position of property



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# Summary

| Has the search report highlighted evidence or potential of |                                            |     |
|------------------------------------------------------------|--------------------------------------------|-----|
| 1                                                          | Past underground coal mining               | Yes |
| 2                                                          | Present underground coal mining            | No  |
| 3                                                          | Future underground coal mining             | Yes |
| 4                                                          | Mine entries                               | Yes |
| 5                                                          | Coal mining geology                        | No  |
| 6                                                          | Past opencast coal mining                  | No  |
| 7                                                          | Present opencast coal mining               | No  |
| 8                                                          | Future opencast coal mining                | No  |
| 9                                                          | Coal mining subsidence                     | No  |
| 10                                                         | Mine gas                                   | No  |
| 11                                                         | Hazards related to coal mining             | No  |
| 12                                                         | Withdrawal of support                      | No  |
| 13                                                         | Working facilities order                   | No  |
| 14                                                         | Payments to owners of former copyhold land | No  |

## Further recommended reports

Mine entry interpretive report

Mine entry plan and data sheets

**For detailed findings, please go to page 4.**

# Detailed findings

## **1. Past underground coal mining**

The property is in a surface area that could be affected by underground mining in 6 seams of coal at 140m to 320m depth, and last worked in 1927.

Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

## **2. Present underground coal mining**

The property is not within a surface area that could be affected by present underground mining.

## **3. Future underground coal mining**

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

## **4. Mine entries**

Within, or within 20 metres of, the boundary of the property there is 1 mine entry, the approximate position of which is shown on the enquiry boundary plot.

Our records disclose the following information:

329343-194. This entry was initially filled with colliery shale by the owners circa 1970 to an unknown specification. In March 1990 Wrexham Maelor Borough Council provided information that they had treated and capped this shaft in accordance with British Coal recommendations. They state that 515 tonne of 9:1 PFA/OPC grout was pressure injected into the shaft fill. The shaft was then covered with a 9.6m X 9.6m X 600mm thick reinforced concrete cap situated in competent clay some 2.6m BGL. Level of top of cap is 121.15m A.O.D.

Mine entry 329343-194 was conveyed to Tsuda (UK) Co. Ltd in 1991.

For an additional fee, the Coal Authority can provide a Mine Entry Interpretive Report. The report will provide a separate assessment for the mine entry/entries referred to in this report. It gives an opinion on the likelihood of mining subsidence damage caused from ground movement as a consequence of the mine entry/entries. It also gives details of the remedies available for subsidence damage where the mine entry was sunk in connection with coal mining.

Please note that it may not be possible to produce a report if the main building to the property cannot be identified from Coal Authority plans (ie for development sites and new build).

For further advice on how to order this additional information please visit [www.groundstability.com](http://www.groundstability.com).

#### **5. Coal mining geology**

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

#### **6. Past opencast coal mining**

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

#### **7. Present opencast coal mining**

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

#### **8. Future opencast coal mining**

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

### **9. Coal mining subsidence**

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

### **10. Mine gas**

The Coal Authority has no record of a mine gas emission requiring action.

### **11. Hazards related to coal mining**

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

### **12. Withdrawal of support**

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

### **13. Working facilities order**

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

### **14. Payments to owners of former copyhold land**

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

# Comments on the Coal Authority information

The Coal Authority own the copyright in this report and the information used is protected by our database right.

The boundary plot shows the approximate location of the disused mine entry/entries referred to in this report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence Act 1991\*). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by visiting [www.groundstability.com](http://www.groundstability.com).

If you wish to discuss the relevance of any of the information contained in this report, you should seek the advice of a qualified mining engineer or surveyor. If you or your advisor wish to examine the source plans from which the information has been taken, these are available to view, free of charge, at our Head Office in Mansfield. To book an appointment please ring 01623 637225. Should you or your advisor wish to carry out a physical investigation that may enter, disturb or interfere with any disused mine entry, prior permission of the owner must be sought. For coal mine entries, the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number is 01623 646333.

\*Note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before

beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

## Additional remarks

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## Alternative formats

If you would like this report in an alternative format, please contact our communications team.

# Enquiry boundary

## Key

Approximate position of enquiry boundary shown



Disused mineshaft



## How to contact us

0345 762 6848 (UK)  
+44 (0)1623 637 000 (International)

200 Lichfield Lane  
Mansfield  
Nottinghamshire  
NG18 4RG

[www.groundstability.com](http://www.groundstability.com)

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## **GROUNDSURE PLANS**

#### Site Details:

Wynnstay Technology Park,  
LL14 6HD

Client Ref: T-16-1794  
Report Ref: GS-2992831  
Grid Ref: 329201, 343569

Map Name: County Series

Map date: 1873

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1873  
Revised 1873  
Edition N/A  
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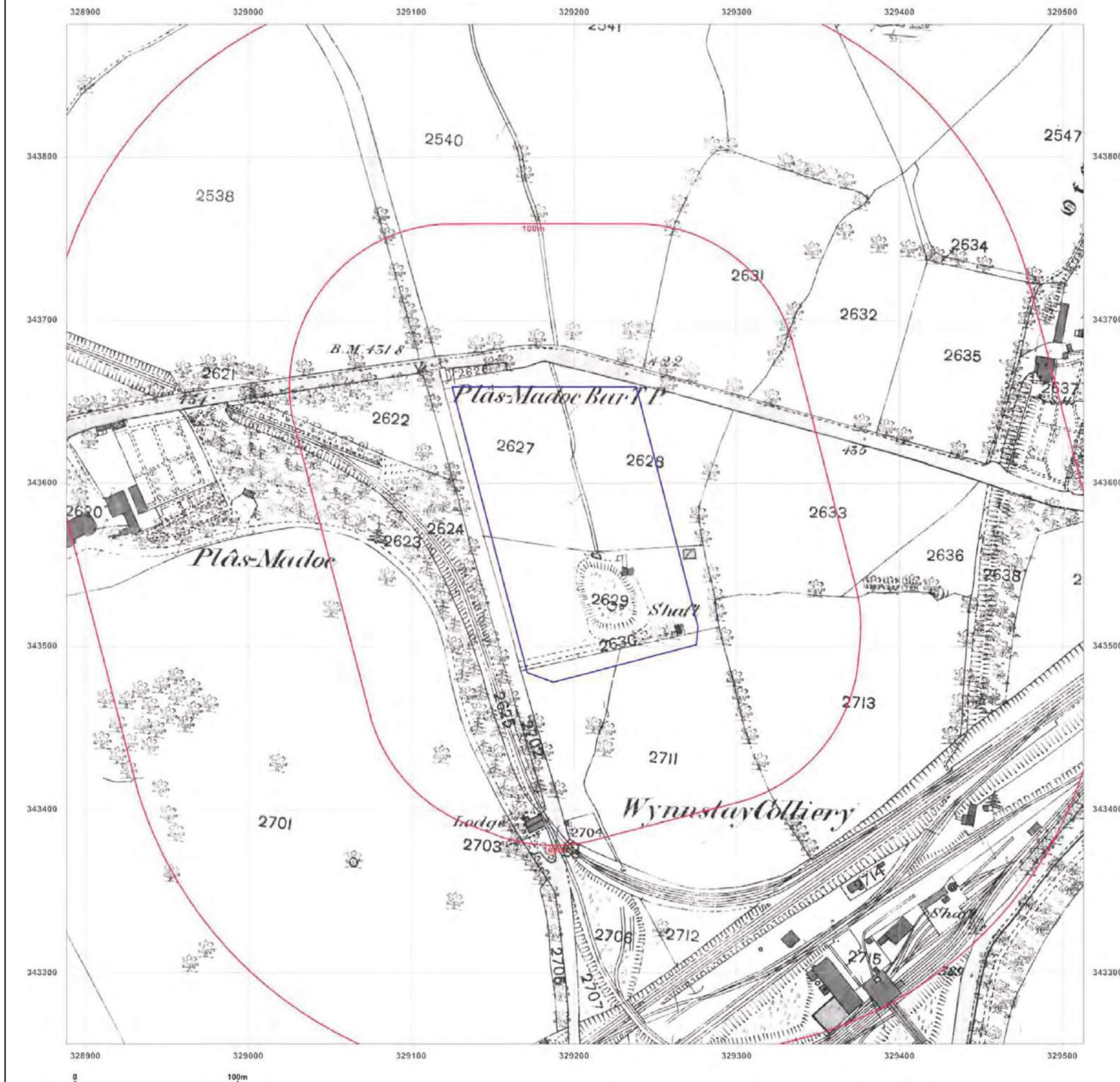


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#### Site Details:

Wynnstay Technology Park,  
LL14 6HD

Client Ref: T-16-1794  
Report Ref: GS-2992831  
Grid Ref: 329201, 343569

Map Name: County Series

Map date: 1899

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1899  
Revised 1899  
Edition N/A  
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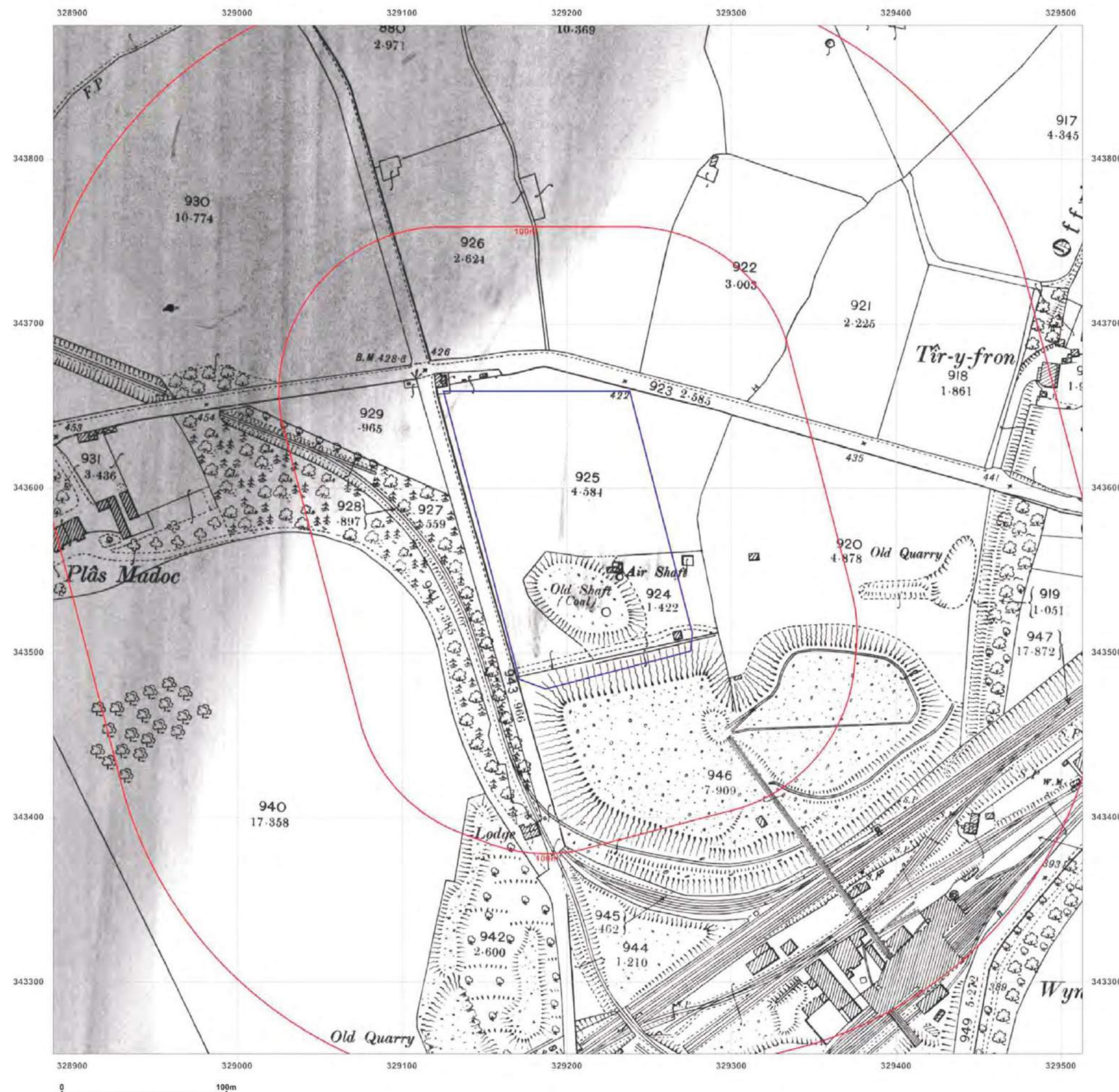


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#### Site Details:

Wynnstay Technology Park,  
LL14 6HD

Client Ref: T-16-1794  
Report Ref: GS-2992831  
Grid Ref: 329201, 343569

Map Name: County Series

Map date: 1912

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1912  
Revised 1912  
Edition N/A  
Copyright N/A  
Levelled N/A

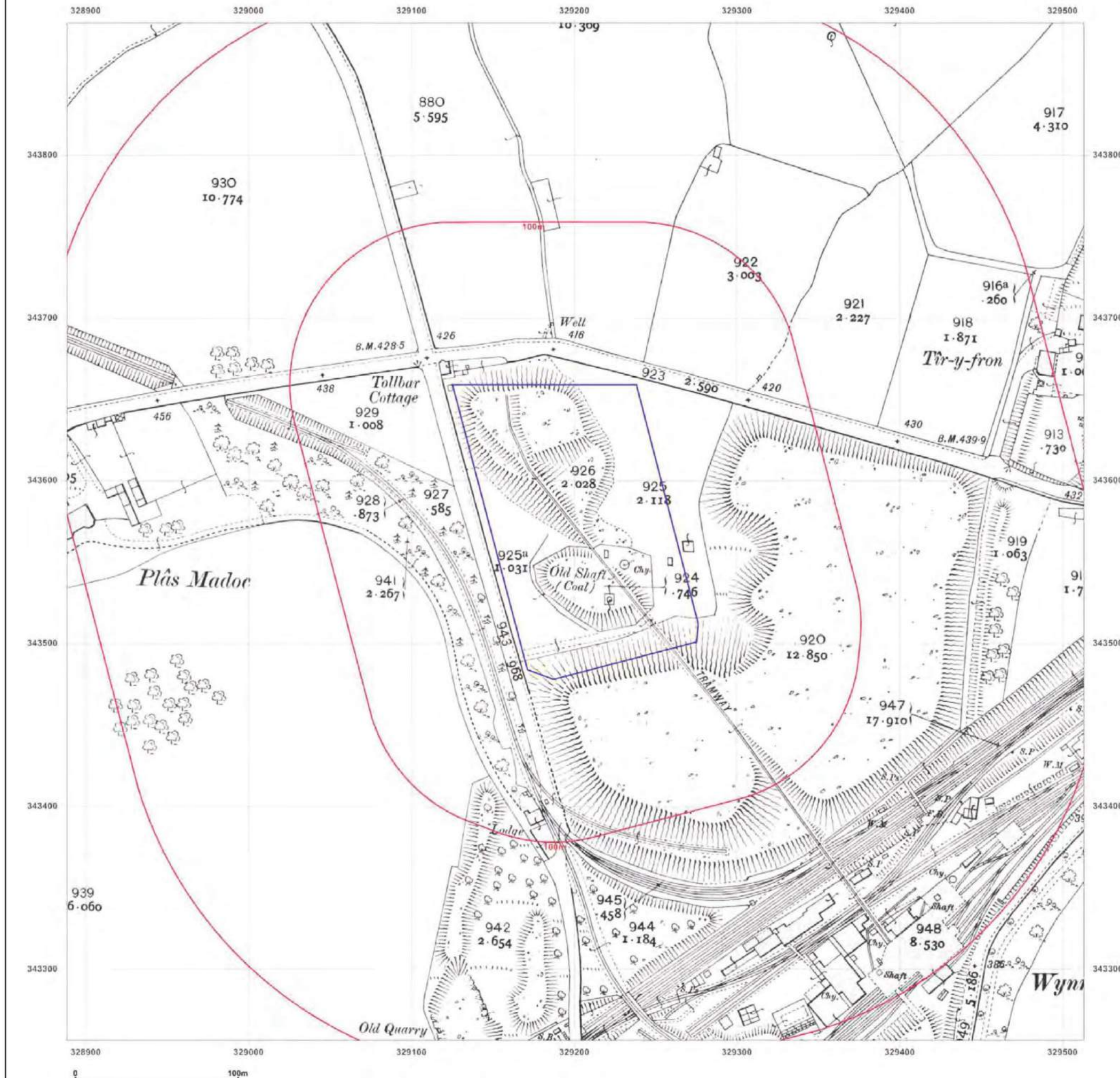


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#### Site Details:

Wynnstay Technology Park,  
LL14 6HD

**Client Ref:** T-16-1794  
**Report Ref:** GS-2992831  
**Grid Ref:** 329201, 343569

**Map Name:** National Grid

**Map date:** 1961

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1961  
Revised 1961  
Edition N/A  
Copyright 1962  
Levelled 1959

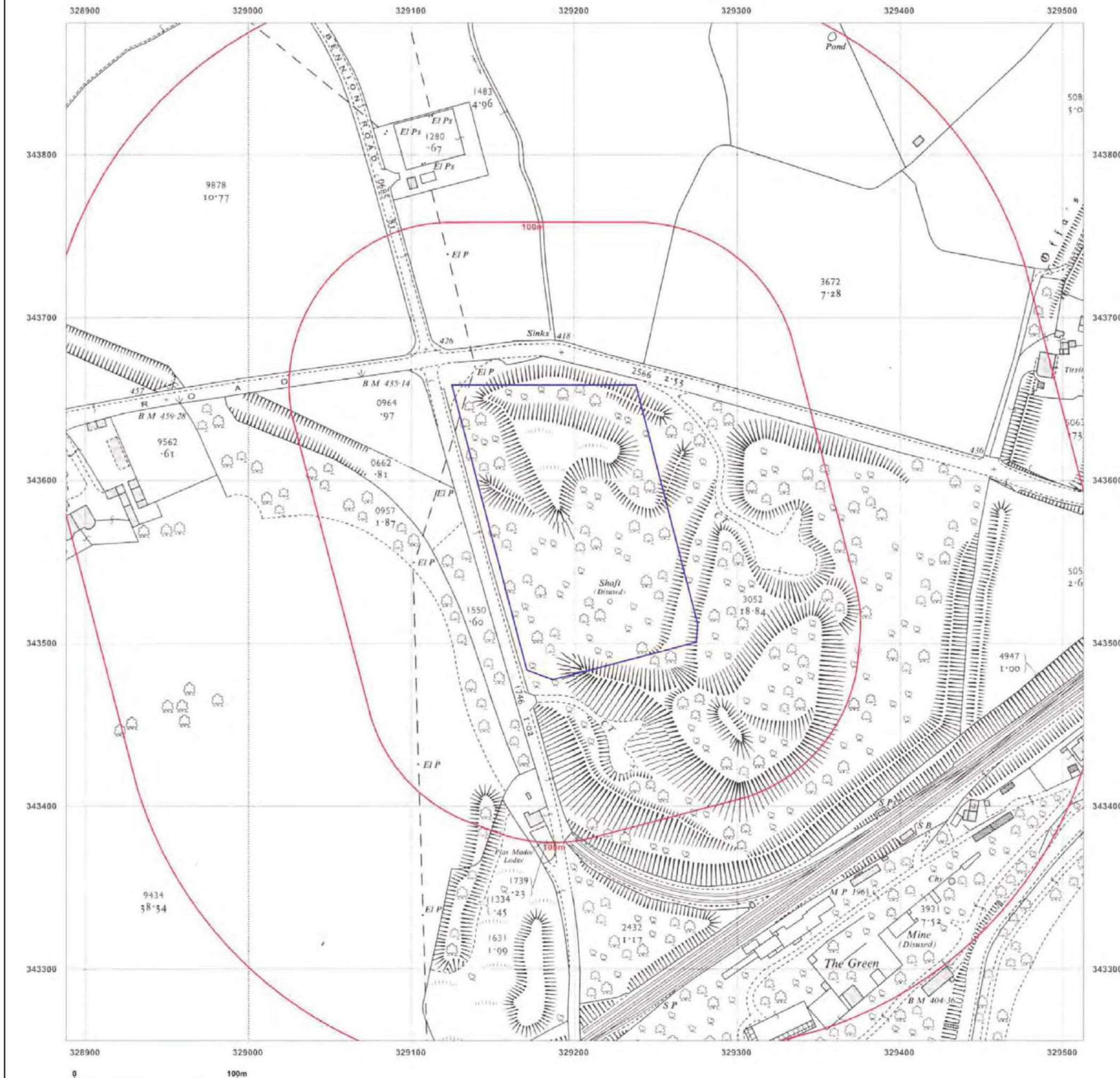


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#### Site Details:

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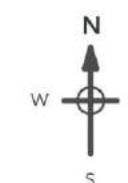
**Client Ref:** T-16-1794  
**Report Ref:** GS-2992831  
**Grid Ref:** 329201, 343569

**Map Name:** National Grid

**Map date:** 1967

**Scale:** 1:2,500

**Printed at:** 1:2,500



Surveyed 1967  
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