

Former Victoria Garage, Ruabon
Proposed Residential Development
Geoenvironmental Report
Brenig Construction Ltd



GroundSolve Ltd

Consulting Geotechnical, Engineering Geology and Environmental Engineers

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1.0 INTRODUCTION

Brenig Construction (BC) propose to redevelop the former Victoria Garage site in Ruabon on behalf of Wales & West Housing Association (WWHA). This will involve demolishing the existing buildings on site, and replacing them with three new terraced properties, together with parking areas and garden areas.

The site was formerly used as a garage and petrol station, before undergoing redevelopment around 10 years ago, with the garage buildings and structures removed, and three residential properties constructed in the central part of the site, although these were never finished and have remained vacant since. The underground fuel tanks associated with the fuel station were not removed as part of the previous development works.

GroundSolve Ltd (GSL) were initially appointed in 2017 by d2 Architects (d2) on behalf of WWHA to carry out preliminary trial pitting and soakaway testing at the front of the site, prior to the demolition of the recently built residential buildings. GSL were subsequently appointed by BC to carry out a full Phase I and II investigation for the area, including the findings of the initial trial pitting works and a further phase of trial pitting once the residential buildings had been demolished and full access was available to the site. GSL were also asked to attend site to carry out validation sampling and testing while the underground fuel tanks were being removed, the results of which were reported in a letter report ref. 2187/VGR/ValRep/SDI , dated 6th March 2019.

This report presents the findings of the Phase I Desk Study, both phases of trial pitting investigations and the tank validation sampling, and presents risk assessments and conceptual site models for the development. It also provides firm geotechnical recommendations for the development and identifies extra over normal construction costs.

2.0 THE SITE

2.1 Site Location and Description

The site is located on High Street in Ruabon, at National Grid Reference SJ 304 439, see Figure 1. The site is some 38m long and 25m wide, and flat.

It is bounded to the west by High Street, and surrounded to the west, south and east by existing residential and commercial properties. A car park is located immediately to the north of the site, see Figure 2.

Until recently, the site was occupied by three two story residential properties of brick construction, which had not been completed. Garden areas were present to the rear of the buildings, which were heavily overgrown, with the western part of the site predominantly covered by concrete and tarmac hard standing (from the previous petrol station use), or bare ground where excavations for services and drainage runs to the existing buildings had been made.

However, these buildings have recently been demolished and the site is now vacant, with a level surface of demolition rubble/made ground present.

Photograph of the site are presented in Appendix A.

2.2 Geology

The geology of the site has been studied on the following sources:

- 1:50,000 scale geology plan Sheet 121 (Wrexham);
- The online BGS geological mapping;
- The Geology of the Country around Wrexham, Reference 1.

The geology plans show the site to be underlain by glaciofluvial deposits (Devensian age sand and gravel), overlying the Etruria Formation of Carboniferous age. This is a red, purple and brown, mudstone with sandstone and conglomerate lenses. A fault is indicated just to the west of the site area, trending in a north-northeast to south-southwest direction, following the approximate line of High Street.

No BGS borehole records are located close enough to the site to provide any further geological information.

The bedrock and superficial deposits beneath the site are both classified as a Secondary A Aquifer. The glacial deposits are also classified as having a high leaching potential, however this is based on the worst-case classification for urban areas or areas of restored mineral workings.

The water table would be anticipated to be at significant depth in the bedrock. Groundwater flows would be anticipated to be in a southwesterly direction following the topography, towards the Afon Eitha.

2.3 Abandoned Mining

A Consultants Coal Mining Report was obtained from the Coal Authority for the site area, and is presented in Appendix B.

The report states that the site is underlain by workings in four seams of coal, at depths of between 525m and 569m, and last mined in 1931. These workings will not affect the site area due to their depth.

The report indicates that there are no probable unrecorded shallow workings, nor any mine entries recorded within 100m of the site boundary.

In addition, the site lies in an area where a notice to withdraw support was given in 1949.

Therefore, past underground mining is not considered to pose any risks to the proposed development.

2.4 History

The history of the site has been studied on old Ordnance Survey plans dating from 1874 at a scale of 1:2500 unless otherwise stated. Recent aerial photographs have also been viewed.

The 1874 OS plan shows the site to be open ground, bounded by a road to the west. Residential development around the village of Ruabon is evident some 200m to the southwest, with a railway in an embankment situated 170m to the west, see Figure 3a.

The 1899 OS plan shows significant residential development immediately to the west of the site, see Figure 3b. A pump is indicated immediately east of the site boundary, with two small buildings and an area of woodland immediately to the northeast.

The 1912 OS plan shows few changes on site or within the immediate surrounding area, although the pump and woodland northeast of the site are no longer evident, see Figure 3c.

The 1938 OS plan, at a scale of 1:10,560, shows a small building in the western half of the site. A school has been constructed to the east of the site, and a small building immediately to the north of the site boundary, see Figure 3d.

The 1961 OS plan shows the site to be occupied by a collection of small buildings, largely in the centre and westernmost parts of the site area, see Figure 3e. A hall is situated immediately north of the site, and a bowling green to the east. Residential properties have been constructed along the High Street up to the southern site boundary. A garage is shown adjacent to the western site boundary, across the High Street.

The 1989 OS plan shows the site area to be occupied by a garage, covering the majority of the site area and accessed from the High Street. The hall to the north of the site has been demolished, see Figure 3f.

Few changes are evident on the 1994 OS plan, except for the construction of a car park immediately north of the site boundary, see Figure 3h.

An aerial photograph dated 2001 shows the garage still in place, see Figure 3h.

3.0 ENVIRONMENTAL SEARCHES

An Envirocheck report has been obtained for the site, the main points are summarised below, and the full report presented in full in Appendix C.

Agency and Hydrological

- The site has potential for groundwater flooding of property situated below ground level,
- The closest discharge consent is 236m northwest of the site, for site drainage to a stream,
- The nearest surface water feature is 288m southwest of the site, the Afon Eitha,
- The nearest pollution incident to controlled waters was recorded 307m southwest of the site, and was a Category 3 incident due to leakage of oils,
- The nearest water abstraction is recorded 981m north of the site, for effluent/slurry dilution,
- The soils have been classified as having a high leaching potential, however this is based on urban areas or areas of restored mineral workings, and the worst-case is adopted until proved otherwise,
- The underlying superficial deposits and bedrock have been classified as Secondary A aquifers.

Waste

- The closest historical landfill site is recorded 243m northwest of the site, at Gardden Clay Pit, where industrial, commercial and household waste was deposited between 1977 and 1984,
- The nearest licensed waste management facility is recorded 228m northwest of the site,
- There is potentially infilled land (pit, quarry, etc) recorded 330m north of the site,
- There is a registered landfill site 375m northwest of the site boundary, at Gardden Clay Pit, recorded as operational. It accepts construction wastes, difficult wastes, household and commercial waste and industrial wastes.

Geological

- There is a BGS recorded mineral site 405m north of the site, at New Hall, Ruabon,
- The potential for collapsible ground related stability hazards is very low,
- There is no hazard potential from compressible ground related hazards,
- The potential for landslide ground stability hazards is very low,
- The potential for running sand hazards is very low,
- The potential for shrinking or swelling clay stability hazards is very low.

The BGS have also supplied estimated soil contaminant values, which are summarised below:

- Arsenic <15 mg/kg
- Cadmium <1.8 mg/kg
- Chromium 60-90 mg/kg
- Lead <100mg/kg
- Nickel 15-30 mg/kg

In addition, the site lies in an intermediate probability radon area as between 3 to 5% of homes are estimated to be at or above the action level. Therefore, basic radon protection measures are required for new dwellings or extensions on the site.

Industrial Land Use

- The closest active industrial land use is a fuel station, recorded 693m northeast of the site.

Sensitive Land Use

- Ancient woodland is recorded 301m south of the site.

4.0 PROPOSED DEVELOPMENT

BC propose to develop the site on behalf of WWHA with three residential properties, with gardens, and an access road and parking area. The proposed layout is presented on Figure 4.

Foundation loads for the proposed structures are anticipated to range from 50 to 75 kN/m run, with floor slab loadings not exceeding 5kN/m².

The recommendations given in this report are based on these assumptions, and should be reviewed and if necessary revised during the detailed design process.

5.0 SITE INVESTIGATIONS

5.1 This investigation

This investigation has been undertaken in three phases: the initial trial pitting and soakaway testing in the western part of the site, validation sampling during the removal of the fuel tanks, and then further trial pitting in the eastern part of the site following demolition of the existing buildings.

The first phase was undertaken on the 9th November 2017, and comprised:

- Five machine dug trial pits to a maximum depth of 3.0m,
- Soakaway testing carried out in one of the trial pits,
- Soil sampling and laboratory testing.

The second phase was undertaken on the 14th February 2019, and comprised:

- Six validation samples taken from the base and sides of the tank excavation.

The third phase was undertaken on the 12th March 2019, and comprised:

- Four machine dug trial pits to a maximum depth of 2.1m,
- Soakaway testing carried out in two of the trial pits.

The trial pits were logged by an engineer from GSL in general accordance with BS 5930, Reference 2. The soakaway tests were carried out by filling the pits quickly with water from a 2000-gallon water bowser and monitoring the fall in water level in general accordance with BRE Digest 365, Reference 3.

The locations of the trial pits, validation sample test locations, and soakaway tests are shown on Figure 2, with the trial pit logs presented in Appendix D. The soakaway test results and calculations are presented in Appendix E.

5.2 Laboratory Work

Samples for chemical testing were taken from the made ground and underlying natural soils encountered in the trial pits, placed in the appropriate containers and a cool box, and taken immediately to the laboratories of ALS in Chester for the following testing:

Metals & Non-metals - Arsenic (As), Boron (B), Cadmium (Cd), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Phenol, Selenium (Se), and Zinc (Zn).

Petroleum Hydrocarbons - Benzene, Toluene, Ethylbenzene, o-xylene, m-xylene, p-xylene, Aliphatics >C5 – C44, Aromatics >EC5 – EC44.

Polyaromatic Hydrocarbons (PAH) – Acenaphthene, Acenaphthylene, Anthracene, Benz (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (g, h, i) perylene, Benzo (k) fluoranthene, Chrysene, Dibenzo (a, h) anthracene, Fluorene, Fluoranthene, Indeno (1,2,3-cd) pyrene, Naphthalene, Phenanthrene, Pyrene.

Other Contaminants – Sulphide (easily liberated), Water soluble Sulphate (2:1 extract), Cyanide, pH, Soil Organic Matter (SOM).

In addition, asbestos screening was carried out on all samples from the trial pits.

However, the tank validation samples were tested for a reduced suite comprising speciated PAHs, TPH-CWG, BTEX compounds and lead, as these are the contaminants of concern most commonly associated with fuel tanks.

The results are summarised in Section 7.0, and the results presented in full in Appendix F.

6.0 GROUND CONDITIONS

6.1 General

The ground conditions encountered by the trial pits are summarised in the table below:

TP Ref.	Stratum Description / Depths (m)	
	Made Ground	Glacial Deposits
TP01	0.0-1.3	1.3-1.9
TP02	0.0-0.9	0.9-2.4
TP03	0.0-0.8	-
TP04	0.0-1.7	-
TP05	0.0-0.6	0.6-3.0
TPA	0.0-1.2	1.2-2.1
TPB	0.0-1.2	1.2-2.1
TPC	0.0-1.1	1.1-1.8
TPD	0.0-0.9	0.9-2.0

6.2 Made Ground

Made ground was encountered from ground level in all of the trial pits, and encountered to a maximum depth of 1.7m in TP4, excavated adjacent to the underground fuel tank.

Subsequent removal of the tank resulted in an excavation nearly 5m deep at this location, which was loosely backfilled following validation sampling. However, the concrete base of the tank was founded on the underlying glacial deposits.

The made ground generally comprised loose or medium dense gravelly sand, or sand and gravel, with frequent inclusions of metal, plastic, glass, timber and brick fragments due to the various previous development works across the site area.

Occasional large concrete boulders, up to 1.2m in diameter, were encountered in TP4 and within the tank removal excavation, and are likely to be old foundations for the former petrol station canopy.

The excavation for the tank removal was loosely infilled with arisings from the removal of old foundations following demolition of the building, and therefore this area is now anticipated to contain significant obstructions to 5m depth.

pH values between 8.19 and 8.67 were recorded within the made ground, with water soluble sulphate values, when measured as a 2:1 water extract, ranging between <0.004g/l to 0.17g/l.

6.3 Glacial Deposits

Glacial deposits were encountered beneath the made ground in all of the trial pit except for TP3 and TP4, which were terminated on obstructions prior to the underground tanks being removed from site.

The glacial deposits were found to comprise medium dense yellow brown and brown slightly silty sand and gravel, with a low cobble content of sandstone.

pH values between 7.52 and 8.39 were recorded within five samples of the glacial deposits, with water soluble sulphate values, when measured as a 2:1 water extract, ranging from <0.004g/l to 0.02g/l.

6.4 Existing Foundations

TP2 was excavated alongside one of the existing buildings prior to its demolition, to investigate the ground conditions at the location of the buildings and to investigate the existing foundations and founding strata.

The trial pit revealed the building to be founded on a shallow strip footing, some 150mm thick and projecting out some 220mm from the building line. The top of the foundation was encountered at 1.1m below existing ground level, and was founded within the glacial sand and gravel.

The buildings have since been demolished and the foundations broken out and removed.

6.5 Underground Fuel Tank

A contractor, J. Freeley Ltd (JFL) was appointed by BC to demolish the existing buildings, and remove the underground fuel tanks and any associated pipe work. During these works, an Engineering Geologist from GSL attended site on 14th February 2019 to obtain validation samples from the base and sides of the tank excavation, in order to determine if any residual hydrocarbon contamination was present at the location of the former tanks and associated pipework.

The fuel tank, which was found to be a single tank split into two halves, had been excavated and removed from site prior to GSL site visit; although photographs were supplied by JFL showing the tank being removed, see Photographs 1 and 2 below. JFL reported that the fuel tank was secured to an underlying concrete base, which was being broken out at the time of GSL's visit.



Photograph 1 – Tank (internally divided into two) prior to removal



Photograph 2 – Tank being removed from excavation

In GSL experience this is common practice to provide weight to prevent flotation of the tanks when they are empty. It may also limit the potential for any leakage from the tank itself migrating downwards into the surrounding soil.

As the tank was found to be full of water, removing it had resulted in around 1m of water sitting above the concrete base, prior to it being broken out, see photograph 3 below. This resulted in difficulty obtaining a clean base to the excavation for sampling purposes. Therefore, a sample was taken from the in-situ soil beneath the slab where it was possible to temporarily exclude the water (sample A), and a sample was also taken of the saturated soil, where the trapped water mixing with the underlying natural soil (sample B).

It should be noted that there was no visible hydrocarbon contamination, sheen, or detectable odour evident on the water or soil.



Photograph 3 – Breaking out underlying concrete slab.

Samples were taken from the in-situ natural soil exposed in the four walls of the excavation, at around 5m depth at the base level of the former tank slab.

The sampling locations are indicated on Figure 2, with the results presented in full in Appendix G. They are summarised in the tables presented in Section 7.0.

6.6 Groundwater

No groundwater was encountered in any of the trial pit excavations. However, a strong water inflow was encountered in TP3 when attempting to excavate alongside the tank prior to its removal.

This was considered to be water trapped in and above the tank, which was proven once the tank was excavated out and water was observed to be trapped above a concrete base before it was broken out.

6.7 Soakaway Testing

Soakaway testing was carried out in TP1 during the initial investigation, and in trial pits TPA and TPB during the subsequent works.

The soakaway testing was carried in general accordance with BRE 365, reference 3. Each pit was filled with water using a 2000-gallon tractor-towed bowser, and the falling water levels recorded over a period of time. The testing was repeated three times, in accordance with the BRE guidance.

The results and calculations are presented in full in Appendix E, and are summarised in the table below:

Location	Infiltration rate (m/s)		
	Test 1	Test 2	Test 3
TP1	4.5×10^{-5}	4.7×10^{-5}	4.4×10^{-5}
TPA	7.15×10^{-5}	5.15×10^{-5}	3.21×10^{-5}
TPB	1.29×10^{-4}	1.37×10^{-4}	1.19×10^{-4}

These results are typical of a slightly silty sand and gravel, and indicate that the site will be suitable for the use of soakaways.

7.0 RESULTS OF CHEMICAL TESTING

The soil samples were taken from the made ground encountered across the site, with sample TP3 taken from soil sediment encountered within the underground fuel tank prior to its removal. The sample depths are presented in the table below.

TP No	Depth (m)
TP2	0.30
TP2	1.00
TP2	1.50
TP3	2.00
TP4	1.20
TP4	1.70
TPA	0.30
TPA	1.00
TPB	0.20
TPB	0.90
TPC	1.10
TPD	0.50

The results of the soil analyses are presented below, where they have been compared to suitable generic assessment criteria (GACs), in order to allow a generic quantitative risk assessment (GQRA) to be carried out for the site and the proposed development.

The Category 4 Screening Levels (C4SLs) published by DEFRA (2014) have been adopted in the first instance, which have been published for six substances to date. Where a C4SL is unavailable, the “Suitable 4 Use Levels” (S4ULs) published by LQM/CIEH (2015) have been adopted.

These criteria have been derived using the CLEA model for a range of standard end-use scenarios and a range of soil organic matter (SOM) contents. It should be noted that the C4SL values are derived on the basis of a “low level of toxicological concern”, while the S4UL values are based on a “tolerable” or “minimal” level of risk. As such, the S4ULs describe a lower level of risk than the C4SLs, and are equivalent to the former Soil Guideline Values (SGVs, published by the Environment Agency) and the previous editions of the LQM/CIEH GAC values.

A “residential with gardens” end-use has been adopted for this analysis, based on the most-conservative SOM content of 1%.

Note: the S4UL values presented below are Copyright Land Quality Management Limited, reproduced with permission; Publication Number S4UL3668. All rights reserved.

Metals & Non-Metals	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Arsenic	3.12	11.5	7.31	7	37	C4SL	0
Boron	1.23	9.43	4.48	7	290	S4UL	0
Cadmium	0.336	0.621	0.42	7	22	C4SL	0
Chromium, Trivalent	<0.9	33.9	14.17	7	910	S4UL	0
Chromium, Hexavalent	<0.6	<0.6	0.6	7	21	C4SL	0
Copper	15.5	39.3	24.99	7	2400	S4UL	0
Lead	9.18	75	43.47	7	200	C4SL	0
Mercury	<0.14	0.528	0.3	7	1.2	S4UL	0
Nickel	16.9	31.7	21.66	7	130	S4UL	0
Phenol	<0.01	<0.01	0.01	7	120	S4UL	0
Selenium	<1	1.09	1.01	7	250	S4UL	0
Zinc	34.8	154	92.57	7	3700	S4UL	0

None of the above values exceeded the relevant GAC values for a residential with gardens end use.

Petroleum Hydrocarbons	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Benzene	<0.01	<0.18	0.03	7	0.87	C4SL	0
Toluene	<0.002	<0.14	0.02	7	130	S4UL	0
Ethylbenzene	<0.003	<0.08	0.01	7	47	S4UL	0
o-xylene	<0.003	<0.2	0.03	7	60	S4UL	0
Aliphatics >C5-C6	<0.01	<0.01	0.01	7	42	S4UL	0
Aliphatics >C6-C8	<0.01	0.026	0.01	7	100	S4UL	0
Aliphatics >C8-C10	<0.01	0.0211	0.01	7	27	S4UL	0
Aliphatics >C10-C12	<0.01	0.0136	0.01	7	130	S4UL	0
Aliphatics >C12-C16	<0.1	1.43	0.51	7	1100	S4UL	0
Aliphatics >C16-C35	<0.1	141.14	48.81	7	65000	S4UL	0
Aliphatics >C35-C44	<0.1	119	30.82	7	65000	S4UL	0
Aromatics >EC5-EC7	<0.01	<0.01	0.01	7	70	S4UL	0
Aromatics >EC7-EC8	<0.01	<0.01	0.01	7	130	S4UL	0
Aromatics >EC8-EC10	<0.01	0.0186	0.01	7	34	S4UL	0
Aromatics >EC10-EC12	<0.01	<0.01	0.01	7	74	S4UL	0
Aromatics >EC12-EC16	<0.1	3.4	1.74	7	140	S4UL	0
Aromatics >EC16-EC21	0.869	52.7	22.99	7	260	S4UL	0
Aromatics >EC21-EC35	5.61	196	99.76	7	1100	S4UL	0
Aromatics >EC35-EC44	3.62	236	71.99	7	1100	S4UL	0

None of the above values exceeded the relevant GAC values for a residential with gardens end use.

Polyaromatic Hydrocarbons (PAH)	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Acenaphthene	<0.04	0.38	0.1	7	210	S4UL	0
Acenaphthylene	<0.012	<0.12	0.07	7	170	S4UL	0
Anthracene	<0.16	1.71	0.45	7	2400	S4UL	0
Benz(a)anthracene	0.339	7.65	2.23	7	7.2	S4UL	1
Benzo(a)pyrene	0.323	6.48	2.3	7	5	C4SL	2
Benzo(b)fluoranthene	0.314	7.54	2.42	7	2.6	S4UL	2
Benzo(g,h,i)perylene	0.217	4.48	1.54	7	320	S4UL	0
Benzo(k)fluoranthene	0.157	3.34	1.11	7	77	S4UL	0
Chrysene	0.317	6.36	1.88	7	15	S4UL	0
Dibenzo(a,h)anthracene	<0.23	1.08	0.36	7	0.24	S4UL	2
Fluoranthene	0.482	17.7	4.7	7	280	S4UL	0
Fluorene	<0.05	0.316	0.09	7	170	S4UL	0
Indeno(1,2,3-cd)pyrene	0.172	3.67	1.24	7	27	S4UL	0
Naphthalene	<0.009	0.182	0.07	7	2.3	S4UL	0
Phenanthrene	0.187	8.02	1.97	7	95	S4UL	0
Pyrene	0.533	15.1	4.08	7	620	S4UL	0

Slight exceedances of the PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(ah)anthracene were recorded in samples from TP3 and TP4, taken from soil encountered within or adjacent to the underground fuel tank prior to its removal. The exceedances were typically minor, with the greatest exceedance being dibenzo(a,h)anthracene, recorded at 1.08 mg/kg in TP4, at 4.5 times the adopted guideline value of 0.24 mg/kg (S4UL).

Other Contaminants / Testing	Min (mg/kg)	Max (mg/kg)	Average (mg/kg)	Count	Adopted Guideline (mg/kg)	Source	Exceedances
Soil Organic Matter (SOM)	<0.35	12.3	4.32	7	-	-	-
pH	7.52	8.67	8.23	13	-	-	-
Sulphide, Easily liberated	<15	123	35.69	7	-	-	-
Cyanide, Total	<1	<1	0.59	7	-	-	-
Water Soluble Sulphate as SO ₄ 2:1 Extract	<0.004	0.317	0.07	13	-	-	-

None of the above values exceed the relevant GAC values for a residential with gardens end use.

The validation samples from the tank removal excavation were tested for a reduced suite, comprising PAH (16, speciated), TPH-CWG, BTEX compounds, and lead, which are considered the major contaminants of concern associated with fuel tanks. These results are summarised in the following tables.

	Base A	Base B	Wall C	Wall D	Wall E	Wall F		
	5.0m	4.8m	4.5m	4.9m	5.0m	4.9m	Adopted Guideline (mg/kg)	Source
Petroleum Hydrocarbons								
Benzene	<0.009	0.0121	<0.009	<0.009	<0.009	<0.009	0.87	C4SL
Toluene	0.00834	0.144	<0.007	<0.007	<0.007	<0.007	130	S4UL
Ethylbenzene	0.00984	0.139	<0.004	<0.004	<0.004	<0.004	47	S4UL
o-xylene	0.0148	0.174	<0.01	<0.01	<0.01	<0.01	60	S4UL
Aliphatics >C5-C6	<0.01	0.129	<0.01	<0.01	<0.01	<0.01	42	S4UL
Aliphatics >C6-C8	0.149	1.03	<0.01	0.061	<0.01	<0.01	100	S4UL
Aliphatics >C8-C10	0.455	3.08	<0.01	0.0848	<0.01	<0.01	27	S4UL
Aliphatics >C10-C12	0.628	1.77	<0.01	0.0983	<0.01	<0.01	130	S4UL
Aliphatics >C12-C16	0.237	2.37	0.349	1.18	<0.1	<0.1	1100	S4UL
Aliphatics >C16-C35	36.12	74.05	5.454	36.31	<0.1	<0.1	65000	S4UL
Aliphatics >C35-C44	18	41.5	<0.1	12.3	<0.1	<0.1	65000	S4UL
Aromatics >EC5-EC7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	70	S4UL
Aromatics >EC7-EC8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	130	S4UL
Aromatics >EC8-EC10	0.304	2.05	<0.01	0.0565	<0.01	<0.01	34	S4UL
Aromatics >EC10-EC12	0.419	1.18	<0.01	0.0655	<0.01	<0.01	74	S4UL
Aromatics >EC12-EC16	1.35	9.17	0.667	0.933	0.56	<0.1	140	S4UL
Aromatics >EC16-EC21	9.7	27.9	<0.1	13.7	<0.1	2.19	260	S4UL
Aromatics >EC21-EC35	60.3	155	3.64	65.6	0.441	1.71	1100	S4UL
Aromatics >EC35-EC44	41.5	98.7	0.453	30.1	<0.1	0.226	1100	S4UL
	Base A	Base B	Wall C	Wall D	Wall E	Wall F		
	5.0m	4.8m	4.5m	4.9m	5.0m	4.9m	Adopted Guideline (mg/kg)	Source
Polyaromatic Hydrocarbons (PAH)								
Acenaphthene	0.047	0.205	<0.008	0.0246	<0.008	<0.008	210	S4UL
Acenaphthylene	<0.06	<0.12	<0.012	0.02	<0.012	<0.012	170	S4UL
Anthracene	0.228	0.723	<0.016	0.118	<0.016	<0.016	2400	S4UL
Benz(a)anthracene	0.803	3.05	0.0309	0.499	<0.014	0.0338	7.2	S4UL
Benzo(a)pyrene	1.09	3.73	0.0589	0.554	<0.015	0.0461	5	C4SL
Benzo(b)fluoranthene	0.91	3.86	0.052	0.545	<0.015	0.0462	2.6	S4UL
Benzo(g,h,i)perylene	0.862	2.98	0.0681	0.429	<0.024	0.0449	320	S4UL
Benzo(k)fluoranthene	0.446	1.75	0.0259	0.226	<0.014	0.0196	77	S4UL
Chrysene	0.741	2.85	0.0262	0.467	<0.01	0.0367	15	S4UL
Dibenzo(a,h)anthracene	0.168	0.603	<0.023	0.0892	<0.023	<0.023	0.24	S4UL
Fluoranthene	1.9	6.81	0.0372	1.17	<0.017	0.0537	280	S4UL
Fluorene	0.0574	0.223	<0.01	0.0174	<0.01	<0.01	170	S4UL
Indeno(1,2,3-cd)pyrene	0.569	1.91	0.0465	0.284	<0.018	0.0277	27	S4UL
Naphthalene	0.111	0.439	<0.009	0.0185	<0.009	<0.009	2.3	S4UL
Phenanthrene	0.877	3.17	<0.015	0.481	<0.015	0.0211	95	S4UL
Pyrene	1.73	5.96	0.038	1.03	<0.015	0.0506	620	S4UL

	Base A	Base B	Wall C	Wall D	Wall E	Wall F		
	5.0m	4.8m	4.5m	4.9m	5.0m	4.9m	Adopted Guideline (mg/kg)	Source
Metals & Non-Metals								
Lead	47.6	58.2	275	56.8	23.3	26.7	200	C4SL

No exceedances of any petroleum hydrocarbon compounds were detected in any of the validation samples taken. Therefore, the area of the former tanks is considered uncontaminated by petroleum hydrocarbons.

However, slightly elevated concentrations of benzo(b)fluoranthene and dibenzo(ah)anthracene were recorded in the sample Base B, and an exceedance of lead was recorded in the sample from Wall C.

8.0 CONCEPTUAL GROUND MODEL AND RISK ASSESSMENT

8.1 General

According to the Contaminated Land Regulations, to determine whether there is a significant possibility of significant harm, the following should be considered:

“The nature and degree of harm, the susceptibility of the receptors and the timescale within which the harm might occur”.

Current good practice therefore requires that the findings from the desk study or site investigation be evaluated for contamination on a site-specific basis using a risk-based approach. Risk assessment involves identification of the hazards and evaluation of the risks associated with these hazards. Risk assessment requires an evaluation of a conceptual “source – pathway – receptor” linkage model and can be qualitative or quantitative.

The basis of an environmental risk assessment involves identifying a ‘source’ of contamination, a ‘pathway’ along which the contamination may migrate and a ‘receptor’ at risk from the contamination.

Current legislation defines the various elements of the pollution linkage as:

- A contaminant ‘source’ is a substance, which is in, or under the ground, and which has the potential to cause harm or to cause pollution of controlled waters.
- A ‘pathway’ is one or more routes through which a receptor is being exposed to, or affected by, a contaminant, or could be so affected.
- A ‘receptor’ is either a living organism, an ecological system, a piece of land or property, or controlled water.

A pollutant linkage indicates that all three elements have been identified. The site can only be defined as ‘Contaminated Land’ if a pollutant linkage exists and the contamination meets the criteria above.

8.2 Hazard Identification

On Site

The desk study has revealed that the site’s previous uses were open fields and woodland, various small buildings, and then a fuel station and garage. Therefore, a wide range of contaminants of concern would be anticipated. The majority of these are associated with the fuel station and garage uses, including fuel/oil spills or leaks from underground tanks and maintenance activities, PAHs, oils and lubricants, and general contamination from any made ground or demolished structures. No inspection pits or deep excavations/basements beneath the old garage buildings were encountered.

The trial pits failed to reveal any visual or olfactory evidence of significant contamination, and only a thin layer of made ground was encountered during the site investigation away from the underground fuel tanks. Exceedances of several PAH compounds were detected in trial pits TP3 and TP4, excavated within or adjacent to the underground fuel tank prior to its removal from site.

Once the underground tanks were removed as part of the demolition works, the validation sampling showed exceedances of benzo(b)fluoranthene, dibenzo(ah)anthracene and a single exceedance of lead, with no elevated hydrocarbons detected.

These exceedances are anticipated to be from ash and combustion products in the general made ground, as encountered in the shallower trial pits TP3 and TP4.

Off Site

The desk study revealed an old garage as a potential source of contamination close to the site, across the high street. Contaminants from this source are considered unlikely to have migrated into the site area, and the contaminants of concern are the same as those tested for on site, as both sites were occupied by garages.

8.3 Summary of Conceptual Ground Model

Potential Contamination Sources	Potential Contaminants of Concern	Potential Pathways	Receptor Group
Localised Made Ground		Inhalation of ground gas Inhalation/ingestion of contaminated dust Dermal contact	Construction Workers End users
Hydrocarbon leaks spills from underground tanks, pipework, and surface spillages, including vehicle maintenance activities	Heavy Metals PAHs Asbestos Petroleum Hydrocarbons BTEX Compounds	Ingestion of soil or home-grown vegetables	Building materials and buried services
Spillages of oils, solvents, paints, etc	Ground Gases/vapours	Leaching of contaminated materials	Surface watercourses and groundwater
Disposal of asbestos-containing materials		Lateral migration / infiltration of gas/water	Building materials and buried services

8.4 Pathways

In relation to any on site contamination reaching potential site users, the following pathways are generally considered:

- Ingestion and skin contact with soils on site,
- Ingestion of homegrown vegetables,
- Inhalation of ground gas,
- Inhalation of contaminated dust,
- Leaching of contaminated materials that may affect controlled waters,
- Direct contact with contaminated material during construction,
- Infiltration and accumulation of ground gas.

8.5 Receptors

The potential impact of a hazard must be assessed with regard to the following target groups:

- Future site users,
- Construction workers,
- Surface and groundwater, both on and off the site,
- Nearby vegetation,
- Building materials and buried services.

8.6 Future Site Users Risk Assessment

The site is to be developed with housing, which is the most sensitive end use.

Elevated concentrations of several PAH compounds and lead have been identified in the made ground. No evidence of any leaks or spills were noted during the investigation or removal of the underground fuel tanks, with the tank excavation being fully validated to prove that no hydrocarbon contamination had occurred.

However, an active source-pathway-receptor link exists between the existing made ground and the site end-users, and requires further action.

Removal of the made ground would remove the source of PAH and lead contamination, and therefore sever the linkage. Severing the pathway by capping the made ground with hard standing or building floor slabs to prevent contact with the soil would also remove the risk posed to the site end users.

Given the proposed layout of the site resulting in much of the site area being occupied by access and parking areas or buildings, both approaches are considered appropriate to remediate the site.

The made ground should be excavated to a minimum depth of 600mm from beneath all garden and landscaping areas, and replaced with 400mm clean imported subsoil and 200mm clean imported topsoil.

Outside of garden areas and any soft landscaping, the provision of hard finished surfaces for parking and access and the building floor slabs are considered sufficient to sever all active pathways, and remove the risks posed to the site end users.

It would also be prudent to undertake a watching brief during shallow excavations, particularly in the area currently occupied by a site compound. Any potentially contaminated material encountered should be excavated, stored safely on site, tested and then disposed of at a suitably licensed landfill facility.

The placement of clean capping soils in garden areas may require validation, including chemical testing of the imported materials to demonstrate their suitability depending on the source of the material, together with confirmation that a minimum thickness of 600mm has been placed. A validation report may also be required to fully discharge all planning conditions.

8.7 Controlled Waters Risk Assessment

When considering the risk to controlled waters both surface waters and underlying aquifers have to be considered.

The closest water course is a river some 288m southwest of the site. The underlying superficial deposits and bedrock are classified as a Secondary A aquifer.

The biggest risk posed to controlled waters would be hydrocarbon migration. However, following the site investigation and tank removal excavation validation works, no significant hydrocarbon contamination has been identified at the site which could affect controlled waters.

In addition, the proposed development will include placement of clean imported topsoil and subsoil to garden areas, together with areas of hardstanding and formal drainage which will reduce the potential for rainwater infiltrations generating significant quantities of leachate as it migrates through the made ground, due to the reduced potential for infiltration to occur.

Therefore, the overall risk to controlled waters from the proposed development is considered to be negligible.

8.8 Construction Workers

The risk to construction workers is considered to be very low; and can be catered for by appropriate PPE and washing facilities in accordance with current good practice.

In accordance with current good practice, a watching brief should be kept on all excavations, should contamination be encountered it should be excavated, stored safely on site, tested and disposed of at a suitably licensed landfill facility.

8.9 Ground Gases

No significant sources of ground gases have been identified during the site investigation works. The nearest recorded landfills are of sufficient distance to the site to pose a very low risk of any gas migration, and in addition are underlain by low permeability glacial till deposits.

Therefore, there is considered to be a negligible risk to the development due to ground gases.

However, the site is situated in an intermediate probability radon area where between 3-5% of houses are above the action level, and therefore basic radon protection measures are required in the construction of new dwellings or extensions.

8.10 Building Materials

The investigation has not revealed any contamination that could adversely affect building materials or services, although this should be checked with the statutory suppliers, who should be supplied with the laboratory test results.

8.11 Vegetation

The existing made ground will be removed from proposed garden areas as part of the development and replaced with clean, imported soil. Therefore, there will be no risk to vegetation following redevelopment.

9.0 GEOTECHNICAL RECOMMENDATIONS

9.1 Excavations and Site Preparation

The site is currently vacant and level following demolition works. However, the large excavation where the former fuel tank was removed has only been loosely infilled with site arisings.

To prepare this area for development, the top 3m of infilled material should be excavated out, and any unsuitable materials or large boulders removed. The resulting excavations should then be backfilled with suitable granular material, which should be compacted in layers in accordance with an approved earthworks specification, such as the Dtp Highways Specification, Reference 5. This will prevent any hard or soft spots developing beneath the proposed parking areas at this location.

Subsequent foundation excavations will be in loose granular made ground and then medium dense sand and gravel, and will be possible using conventional earth moving equipment. However, it should be noted that boulders may be encountered in confined excavation, which will require breaking out. Excavation sides are likely to be unstable, and collapses of any excavations left open should be anticipated. Any excavations deeper than 1.2m that are to be entered will need to be shored or battered back for safety reasons.

Based on the results of this investigation, no significant inflows of groundwater are anticipated in shallow excavations. If any inflows are encountered, they should be slight and easily catered for by pumping from sumps cut within the excavations.

9.2 Foundations and Floor Slabs

Conventional spread foundations are considered suitable for the development, founded in the underlying medium dense glacial sand and gravel at a minimum depth of 0.75m below final external ground levels.

The glacial sand and gravel was encountered at depths ranging from 0.6m to >1.7m during the site investigation at the location of the proposed houses, however greater depths are possible following site disturbance after the demolition works and underground tank removal works. Consequently, foundations depths may vary considerably.

Strip foundations should be designed assuming an allowable bearing pressure of 150kN/m², which would be achievable based on the anticipated loadings using a standard excavator bucket (0.6m wide).

Floor slabs should be designed as suspended, as more than 600mm of made ground or structural fill is anticipated beneath the floor slabs, in accordance with the NHBC guidelines, reference 6.

9.3 Drainage

The soakaway testing carried out has shown the granular glacial deposits to have a permeability of between 10^{-4} and 10^{-5} m/s, and therefore the site is considered suitable for soakaway drainage systems.

It is likely to be preferable to place the soakaway drainage systems beneath the parking areas at the front of the site, which would likely reduce the requirement to import as much material to suitably backfill the tank excavation during the site preparation works.

9.4 Reuse of Materials

The site is currently level, and no reuse of any excavated materials is anticipated.

In addition, no topsoil is currently present on site. Imported materials will be required for clean capping to garden areas, including 200mm of imported topsoil to form all garden areas and any soft landscaping.

9.5 Protection of Buried Concrete

In accordance with Reference 7 and assuming mobile groundwater, the buried concrete can be classified as:

- DS-1,
- AC-1.

9.6 Roads and Hard standings

No California Bearing Ratio (CBR) testing was carried out as part of this investigation.

A CBR value of at least of 3% would typically be feasible in the glacial deposits observed in the trial pits. Where the tank excavation is recompacted and infilled with suitable granular materials, CBR values in excess of 5% would be easily achievable.

All formations should be proof-rolled, and any loose or soft areas excavated, typically an additional 300mm, and the resultant excavation backfilled with suitable, well-compacted granular materials.

9.7 Landfill and Radon Gas

No sources of ground gas that may affect the site have been identified by the site investigation works, therefore no gas protection measures are considered necessary.

However, the site is located in an intermediate probability radon area, and basic radon protective measures are required for the proposed development.

REFERENCES

1. The Geology of the Country around Wrexham, British Geological Survey, 1928.
2. BS 5930:2015, Code of Practice for Site Investigation.
3. BRE Digest 365, Soakaway Design, 2003.
4. BS 1377:1991, British Standard Methods of Tests for Soils for Civil engineering Purposes.
5. Manual of Contract Documents for Highway Works, Volume 1, Specification for Highway Works - Series 600, Department of Transport, 2016.
6. NHBC Standards, Part 4 Foundations, 2007.
7. BRE Special Digest 1, 2005, Concrete in Aggressive Ground.

FIGURES

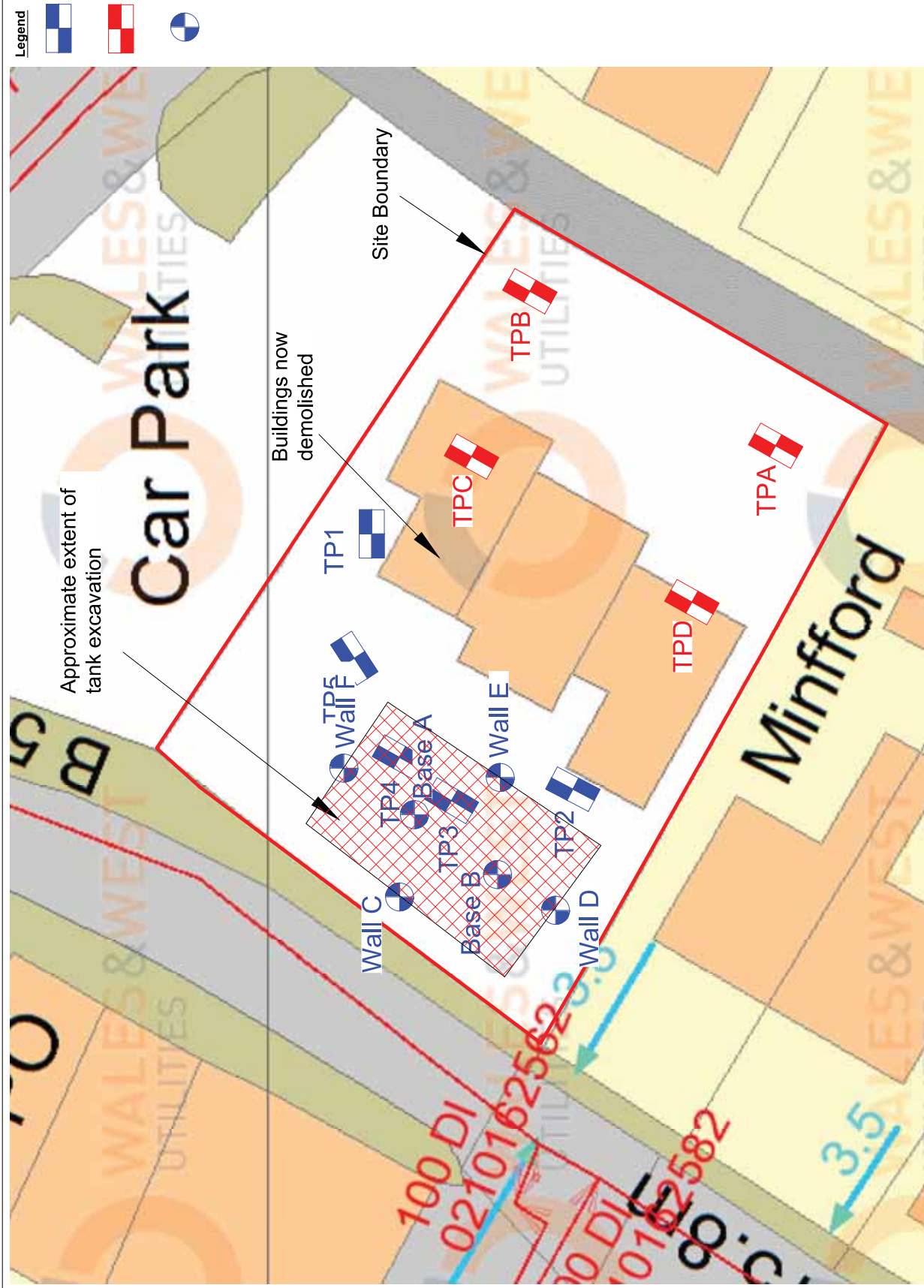


Site Location

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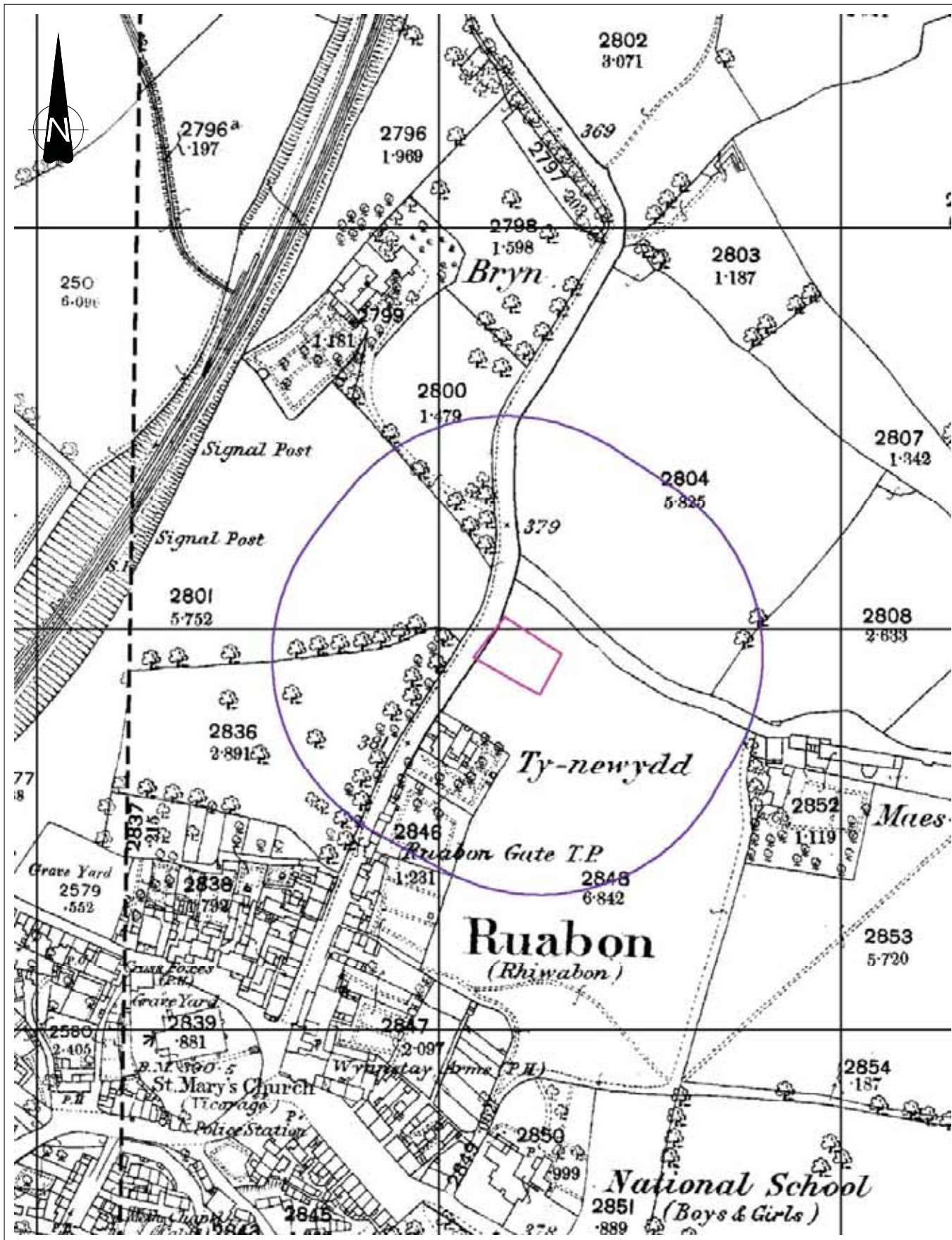
Figure Title
SITE LOCATION

FIGURE 1



SCALE 1:200 @ A3

Figure Title
**SITE LAYOUT & TRIAL
PIT LOCATIONS**

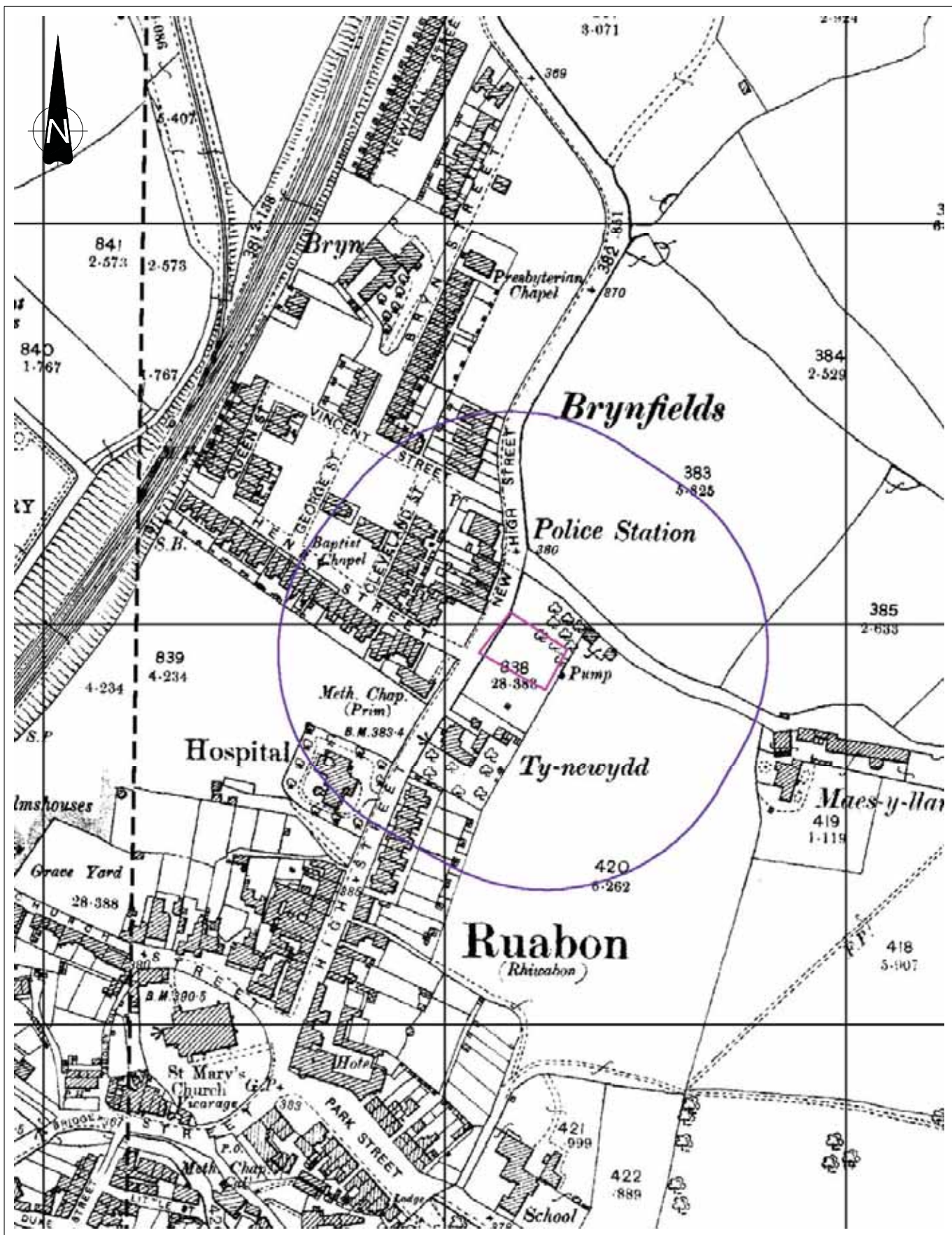


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Figure Title

History
1874

FIGURE 3a

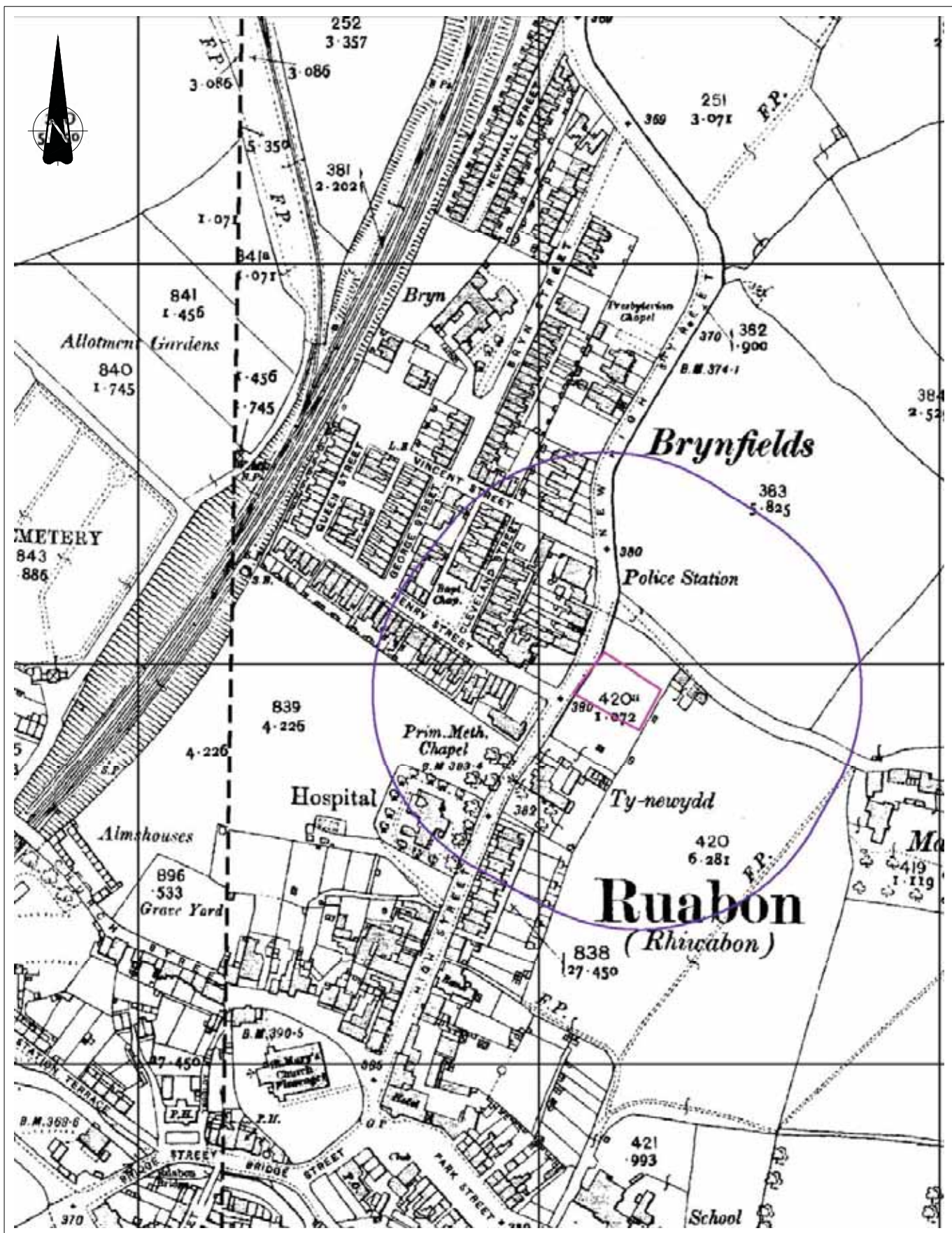


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Figure Title

History
1899

FIGURE 3b

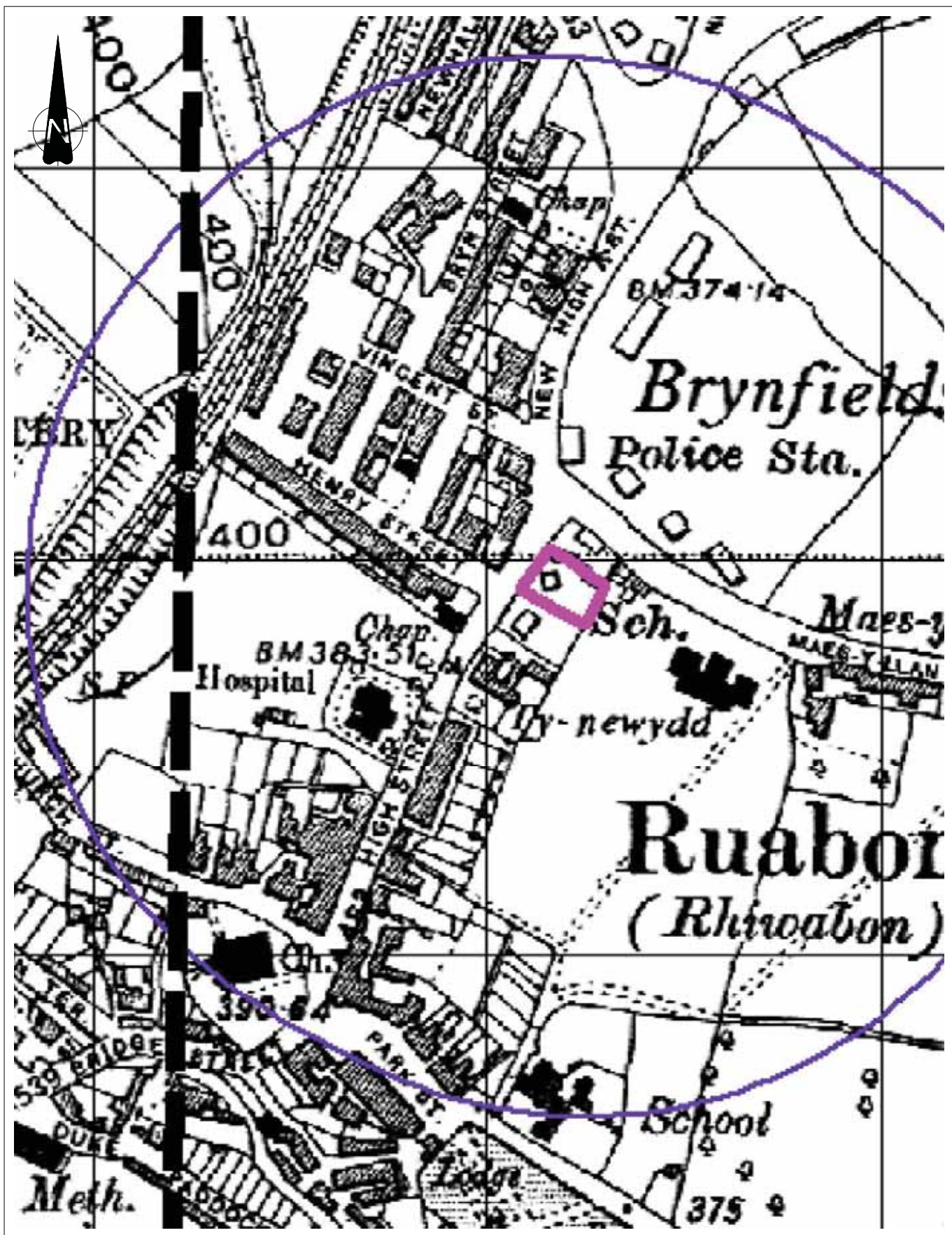


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Figure Title

History
1912

FIGURE 3c

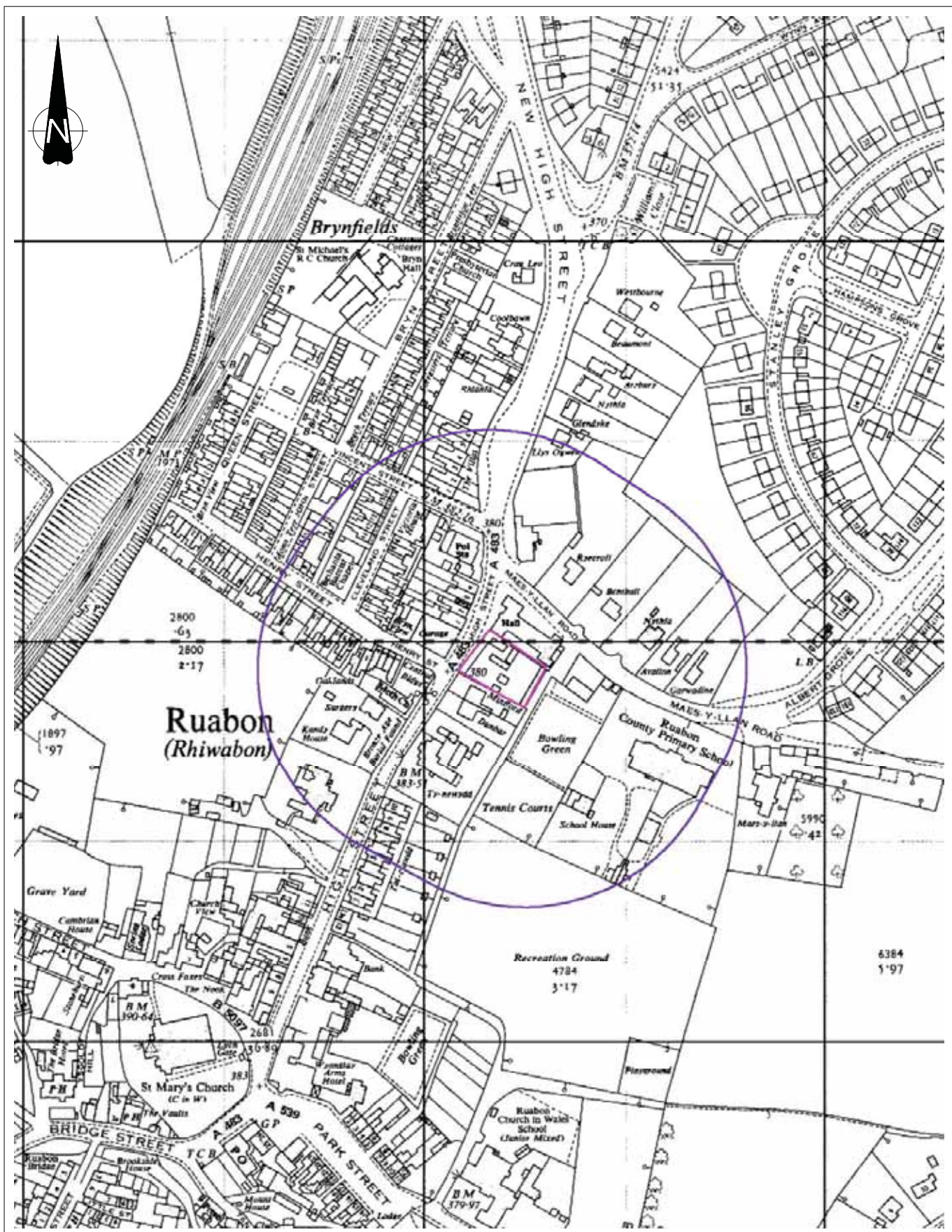


SCALE 1:2500 @ A4

Figure Title

History
1938

FIGURE 3d

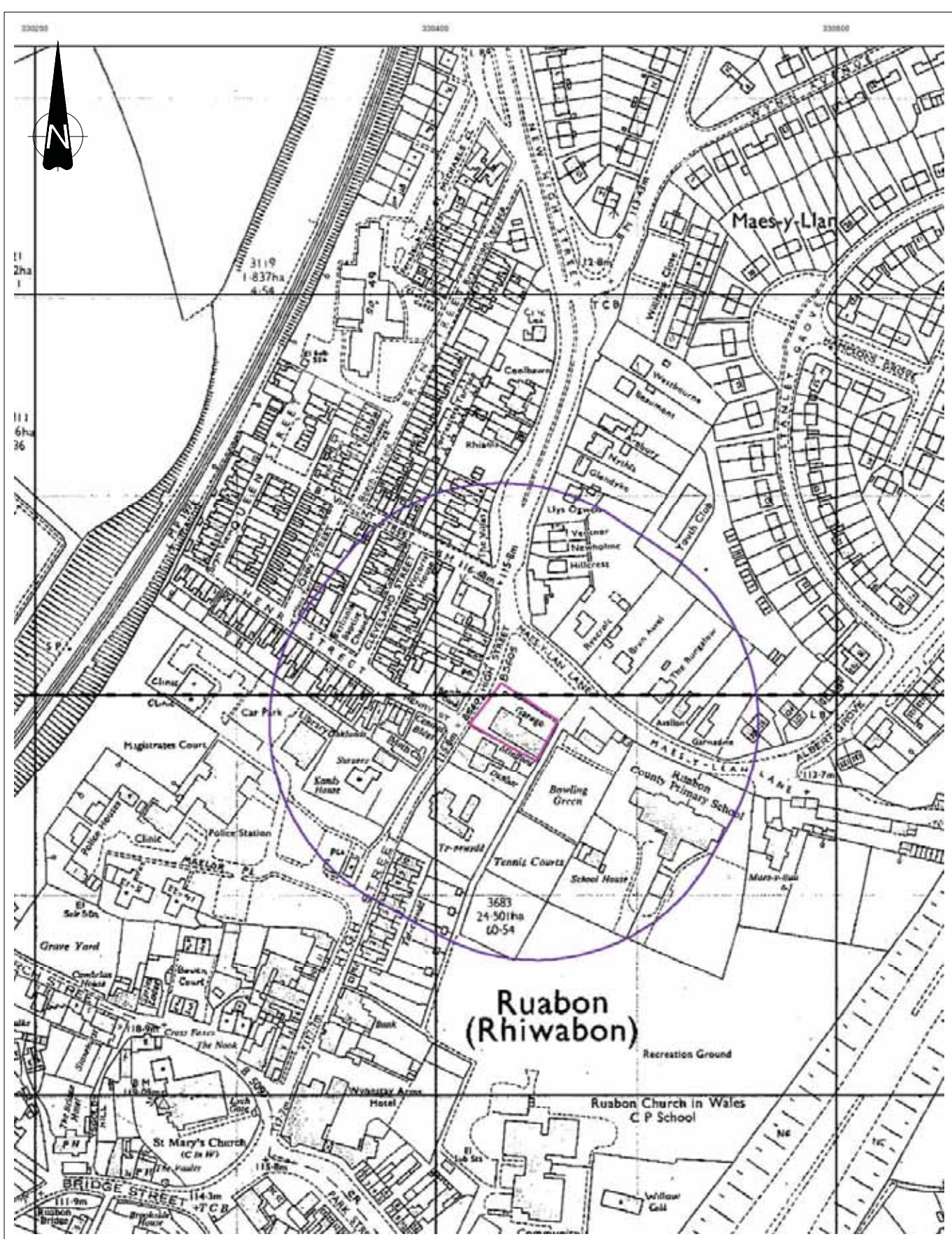


SCALE 1:2500 @ A4

Figure Title

History
1961

FIGURE 3e



SCALE 1:2500 @ A4

Figure Title

History
1989

FIGURE 3f



SCALE 1:2500 @ A4

Figure Title

History

1994

FIGURE 3g

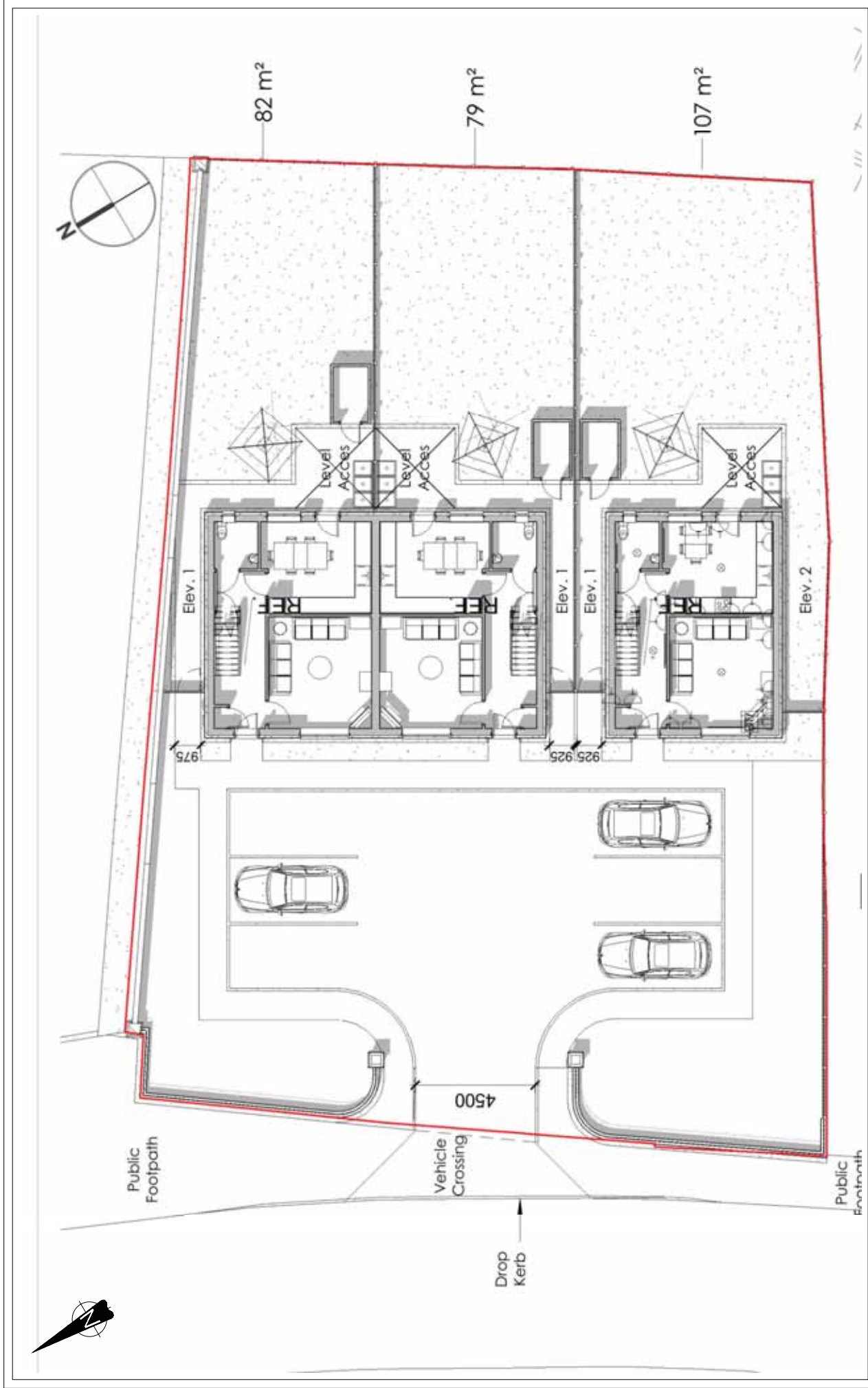


SCALE 1:2500 @ A4

Figure Title

History
2001

FIGURE 3h



SCALE 1:200 @ A3

Figure Title
Proposed Site Layout

APPENDIX A

Site Photographs



Photograph 1 Site from Ruabon High Street, prior to demolition



Photograph 2 Site Entrance, prior to demolition



Photograph 3 Garden areas to rear of existing buildings, prior to demolition



Photograph 4 Concrete and tarmac hardstanding in western part of site, prior to demolition



Photograph 5 Site area following demolition of buildings

APPENDIX B

Consultants Coal Mining Report



The Coal
Authority

Consultants Coal Mining Report

Buildings At
High Street
Ruabon
Wrexham
LL14 6BL

Date of enquiry:	5 April 2019
Date enquiry received:	5 April 2019
Issue date:	5 April 2019
Our reference:	51002093850001
Your reference:	2187/VGR/JH



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

GROUNDSOLVE LTD

Enquiry address

Buildings At
High Street
Ruabon
Wrexham
LL14 6BL

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www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	QUAKER	Coal	3ACV	525	East	6.3	South-East	130	1913
unnamed	HALF YARD / QUEEN	Coal	3301	542	North	7.0	South-East	10	1931
unnamed	QUAKER	Coal	3ACT	543	South-East	1.7	South	130	1913
unnamed	RUABON YARD (SOFT 5 QTRS)	Coal	382V	569	South-West	14.0	South-East	110	1927

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

NW1469	10608	
--------	-------	--

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

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.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

The property is in an area where a notice to withdraw support was given in 1949.

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.

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.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

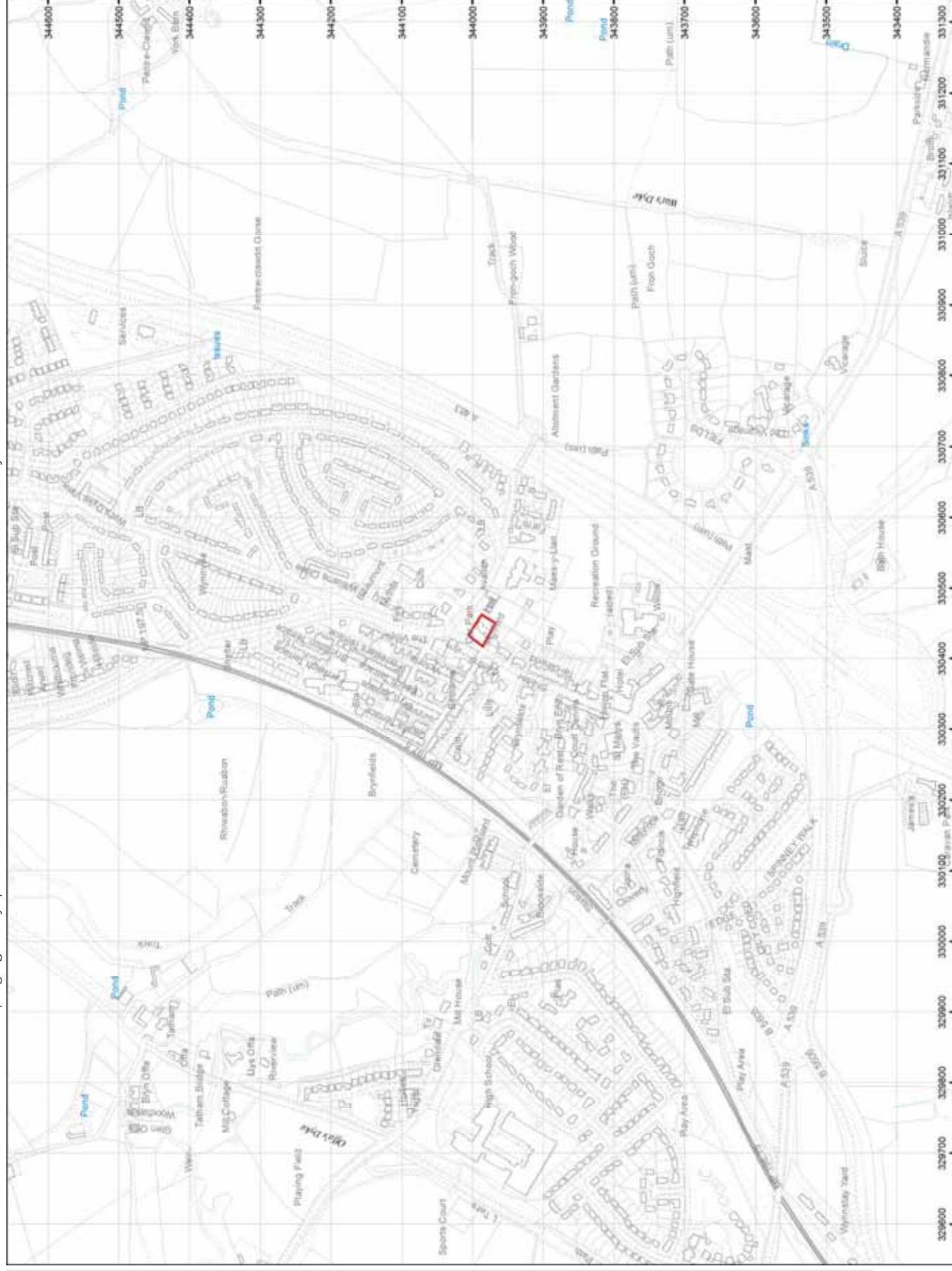
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VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	05 April 2019
Issued to	GROUND SOLVE LTD WELL HOUSE BARNS CHESTER ROAD BROUGHTON FLINTSHIRE CH4 0DH
Property search for	BUILDINGS AT HIGH STREET RUABON WREXHAM LL14 6BL
Reference number	51002093850001
Date of issue	05 April 2019
Cost	£112.13
VAT @ 20%	£22.43
Total received	£134.56
VAT registration	598 5850 68

Summary of findings

The map highlights any specific surface or subsurface features within or near to the boundary of the site.



APPENDIX C

Envirocheck Report

Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

195243082_1_1

Customer Reference:

2187/sdi

National Grid Reference:

330440, 343990

Slice:

A

Site Area (Ha):

0.09

Search Buffer (m):

1000

Site Details:

Buildings At, High Street

Ruabon

WREXHAM

LL14 6BL

Client Details:

Mr M Scott

GroundSolve Ltd

Unit 1

Well House Barns

Chester Road

Bretton

Flintshire

CH4 0DH

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	17
Hazardous Substances	-
Geological	23
Industrial Land Use	28
Sensitive Land Use	33
Data Currency	35
Data Suppliers	42
Useful Contacts	43

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 2		2	4	10
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 6				3
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature				Yes	
Pollution Incidents to Controlled Waters	pg 7			3	7
Prosecutions Relating to Authorised Processes	pg 8				1
Registered Radioactive Substances					
River Quality	pg 8			1	
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points	pg 9			1	
Substantiated Pollution Incident Register	pg 9				3
Water Abstractions	pg 10				1 (*2)
Water Industry Act Referrals	pg 10			1	1
Groundwater Vulnerability	pg 11	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 11	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 11			7	34

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 17		1		1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 17		1	1	
Licensed Waste Management Facilities (Locations)	pg 17				6
Local Authority Landfill Coverage	pg 19	1	n/a	n/a	n/a
Local Authority Recorded Landfill Sites					
Potentially Infilled Land (Non-Water)	pg 19			3	2
Potentially Infilled Land (Water)	pg 19		2	1	5
Registered Landfill Sites	pg 20			3	3
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites					
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 23	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 23	Yes		Yes	Yes
BGS Recorded Mineral Sites	pg 25			1	5
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas	pg 26	Yes	n/a	n/a	n/a
Mining Instability	pg 26	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 26	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 26	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards				n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 26	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 26	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 26		Yes	n/a	n/a
Radon Potential - Radon Affected Areas	pg 27	Yes	n/a	n/a	n/a
Radon Potential - Radon Protection Measures	pg 27	Yes	n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 28		1	3	19
Fuel Station Entries	pg 30	1			1
Points of Interest - Commercial Services	pg 30				7
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 30				1
Points of Interest - Public Infrastructure	pg 30		2	4	11
Points of Interest - Recreational and Environmental	pg 32		1		4
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 33			6	11
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones					
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (N)	0	1	330439 343986
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (SW)	40	1	330400 343950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13NE (E)	42	1	330500 344000
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13SW (W)	167	1	330250 343986
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (W)	218	1	330200 344000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (W)	220	1	330200 343950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (NE)	221	1	330650 344100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NW (NW)	236	1	330300 344200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13SW (SW)	256	1	330200 343850
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (SE)	261	1	330650 343800
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A13SW (W)	281	1	330150 343900
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SE (S)	286	1	330550 343700
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12SE (W)	317	1	330100 343986
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (W)	319	1	330100 343950
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13NE (NE)	321	1	330700 344200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12SE (W)	367	1	330050 343986
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12NE (W)	368	1	330050 344000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A13SW (SW)	391	1	330150 343700
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A14NW (NE)	401	1	330800 344200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12NE (W)	418	1	330000 344000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	422	1	330000 344050
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12NE (W)	433	1	330000 344100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14SW (E)	439	1	330900 343986
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12SE (W)	439	1	330000 343850
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A12NE (W)	449	1	330000 344150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A14NW (NE)	462	1	330800 344300
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (S)	471	1	330400 343500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (S)	478	1	330550 343500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12SE (SW)	479	1	330000 343750
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12NE (W)	481	1	329950 344100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A18SW (N)	481	1	330250 344450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (SW)	487	1	330200 343550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NE (W)	496	1	329950 344150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A19SW (NE)	497	1	330800 344350
1	Discharge Consents Operator: Wrg Property Type: Unspecified Tip Location: Gardden Lodge Landfill Site Ruabon, Tatham Road, Wrexham Authority: Natural Resources Wales Catchment Area: Not Supplied Reference: Cg038700101 Permit Version: 1 Effective Date: 19th May 2000 Issued Date: 19th May 2000 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Site Drainage Discharge: Freshwater Stream/River Environment: Receiving Water: Drainage System Via A Culvert Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m	A13NW (NW)	236	2	330300 344200
1	Discharge Consents Operator: Wrg Property Type: Not Supplied Location: Gardden Lodge Landfill Site Ruabon, Tatham Road, Wrexham Authority: Natural Resources Wales Catchment Area: EITHA Reference: Cg0387001 Permit Version: 1 Effective Date: 19th May 2000 Issued Date: 19th May 2000 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Site Drainage Discharge: Freshwater Stream/River Environment: Receiving Water: Drainage System Via A Culvert Status: Effective Positional Accuracy: Located by supplier to within 100m	A13NW (NW)	236	2	330300 344200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
2	Discharge Consents Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Pumping Staions Location: Tal Y Lan Cso, Ruabon Ps (Se Of Bridge Street), (Se Of Bridge Street) Ruabon Authority: Natural Resources Wales Catchment Area: EITHA Reference: CM0008201 Permit Version: 1 Effective Date: 8th January 1960 Issued Date: 8th January 1960 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Eitha Status: Effective Positional Accuracy: Located by supplier to within 10m	A13SW (S)	327	2	330331 343663
2	Discharge Consents Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Pumping Staions Location: Ruabon Ps, LI14 1us Authority: Natural Resources Wales Catchment Area: EITHA Reference: Cm0190801 Permit Version: 3 Effective Date: 19th December 2011 Issued Date: 19th December 2011 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Pumping Station - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Eitha Status: Effective Positional Accuracy: Located by supplier to within 10m	A13SW (S)	330	2	330353 343652
3	Discharge Consents Operator: Mr D Bruce Property Type: Undefined Or Other Location: Ruabon 5 Duke Street Private Garage Authority: Natural Resources Wales Catchment Area: River Dee Reference: Cm0033401 Permit Version: 1 Effective Date: 20th April 1966 Issued Date: 20th April 1966 Revocation Date: 5th April 1995 Discharge Type: Unspecified Discharge: Not Supplied Environment: Receiving Water: Eitha Status: Consent expired Positional Accuracy: Located by supplier to within 10m	A13SW (SW)	331	2	330220 343720
4	Discharge Consents Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Paddock Row Ruabon Authority: Natural Resources Wales Catchment Area: EITHA Reference: CG0358201 Permit Version: 1 Effective Date: 21st July 1994 Issued Date: 21st July 1994 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: River Eitha Status: Effective Positional Accuracy: Located by supplier to within 100m	A8NW (S)	375	2	330310 343620

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	Discharge Consents Operator: Clwyd County Council Property Type: Education Location: Ruabon Comprehensive School Authority: Natural Resources Wales Catchment Area: River Dee Reference: Cm0055601 Permit Version: 1 Effective Date: 20th March 1969 Issued Date: 20th March 1969 Revocation Date: 5th April 1995 Discharge Type: Unspecified Discharge: Not Supplied Environment: Receiving Water: Eitha Status: Consent expired Positional Accuracy: Located by supplier to within 10m	A12NE (W)	524	2	329900 344070
6	Discharge Consents Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ruabon New Hall Road - Sso Authority: Natural Resources Wales Catchment Area: River Dee Reference: Cm0199401 Permit Version: 1 Effective Date: 20th October 1989 Issued Date: 20th October 1989 Revocation Date: 4th March 1994 Discharge Type: Unspecified Discharge: Not Supplied Environment: Receiving Water: Black Brook Status: Consent expired Positional Accuracy: Located by supplier to within 100m	A18NE (N)	744	2	330700 344700
7	Discharge Consents Operator: Trevalyn Estates Ltd Property Type: Industrial Parks & Estates Location: Gardden Ind Estate Tatham Road Rua, Tatham Road, Ruabon, Wrexham Authority: Natural Resources Wales Catchment Area: BLACK BROOK (CLYWEDOG) Reference: CM0090101 Permit Version: 1 Effective Date: 19th November 1980 Issued Date: 19th November 1980 Revocation Date: Not Supplied Discharge Type: Sewage And Trade Combined - Unspecified Discharge: Freshwater Stream/River Environment: Receiving Water: Goch Status: Effective Positional Accuracy: Located by supplier to within 100m	A18NW (N)	828	2	330200 344800
8	Discharge Consents Operator: Wrg Property Type: Not Supplied Location: Gardden Lodge Landfill Site Ruabon, Tatham Road, Ruabon Wrexham Authority: Natural Resources Wales Catchment Area: BLACK BROOK (CLYWEDOG) Reference: Cm0180301 Permit Version: 3 Effective Date: 20th May 2000 Issued Date: 4th May 1993 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Site Drainage Discharge: Freshwater Stream/River Environment: Receiving Water: Afon Goch Status: Effective Positional Accuracy: Located by supplier to within 10m	A18NW (N)	872	2	330150 344830

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	Discharge Consents Operator: Shanks Waste Services Ltd Property Type: Unspecified Tip Location: Gardden Lodge Landfill Site Ruabon, Tatham Road, Ruabon Wrexham Authority: Natural Resources Wales Catchment Area: River Dee Reference: CM0180301 Permit Version: 2 Effective Date: 4th May 1993 Issued Date: 4th May 1993 Revocation Date: 19th May 2000 Discharge Type: Waste Site - Unspecified Discharge: Not Supplied Environment: Receiving Water: Afon Goch Status: Modified (Water Resources Act 1991, Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m	A18NW (N)	872	2	330150 344830
8	Discharge Consents Operator: Shanks & Mcewan (Northern) Ltd Property Type: Unspecified Tip Location: Gardden Lodge Landfill Site Ruabon, Tatham Road, Ruabon Wrexham Authority: Natural Resources Wales Catchment Area: River Dee Reference: Cm0180301 Permit Version: 1 Effective Date: 21st March 1989 Issued Date: 21st March 1989 Revocation Date: 3rd May 1993 Discharge Type: Waste Site - Unspecified Discharge: Not Supplied Environment: Receiving Water: Afon Goch Status: Authorisation revoked Positional Accuracy: Located by supplier to within 10m	A18NW (N)	872	2	330150 344830
9	Discharge Consents Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers - Water Company Location: Ruabon Combined Sewerage System, New Hall Road, Ruabon Authority: Natural Resources Wales Catchment Area: BLACK BROOK (CLYWEDOG) Reference: Cm0050201 Permit Version: 3 Effective Date: 31st March 2009 Issued Date: 31st March 2009 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Stw Storm Overflow/Storm Tank - Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Goch Status: Effective Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	902	2	330817 344821
10	Discharge Consents Operator: Trevalyn Estates Ltd Property Type: Industrial Parks & Estates Location: Gardden Ind Estate Tatham Road Rua, Tatham Road, Ruabon, Wrexham Authority: Natural Resources Wales Catchment Area: BLACK BROOK (CLYWEDOG) Reference: CM0090001 Permit Version: 1 Effective Date: 19th November 1980 Issued Date: 19th November 1980 Revocation Date: Not Supplied Discharge Type: Sewage And Trade Combined - Unspecified Discharge: Freshwater Stream/River Environment: Receiving Water: Goch Status: Effective Positional Accuracy: Located by supplier to within 100m	A18NW (N)	924	2	330200 344900

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
11	Discharge Consents Operator: Clwyd Compounders Limited Property Type: Other Rubber Manufacture Location: Septic Tank Serving Unit 1, Gardden, Unit 1, Gardden Industrial Estate, Ruabon, Wrexham, LL14 6rg Authority: Natural Resources Wales Catchment Area: Not Supplied Reference: Eprb3097tc Permit Version: 1 Effective Date: 7th January 2014 Issued Date: 7th January 2014 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Into Land Environment: Receiving Water: Groundwater Status: New issued under EPR 2010 Positional Accuracy: Located by supplier to within 10m	A17NE (N)	963	2	330083 344903
11	Discharge Consents Operator: Clwyd Compounders Limited Property Type: Not Supplied Location: Septic Tank Serving Unit 1, Gardden, Unit 1, Gardden Industrial Estate, Ruabon, Wrexham, LL14 6rg Authority: Natural Resources Wales Catchment Area: BLACK BROOK (CLYWEDOG) Reference: Rb3097tc Permit Version: 1 Effective Date: 7th January 2014 Issued Date: 7th January 2014 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Into Land Environment: Receiving Water: Groundwater Status: Effective Positional Accuracy: Located by supplier to within 10m	A17NE (N)	963	2	330083 344903
12	Local Authority Pollution Prevention and Controls Name: Total Oil Uk Ltd Location: A483, Ruabon, WREXHAM, Clwyd, LL14 6YY Authority: Wrexham County Borough Council, Environmental Health Department Permit Reference: WCBC/PG1/14(3)V2 Dated: 23rd December 1998 Process Type: Local Authority Air Pollution Control Description: PG1/14 Petrol filling station Status: Authorised Positional Accuracy: Automatically positioned to the address	A19SW (NE)	693	3	330885 344535
13	Local Authority Pollution Prevention and Controls Name: Clwyd Compounders Ltd Location: Gardden Industrial Estate, Ruabon, WREXHAM, Clwyd, LL14 6RG Authority: Wrexham County Borough Council, Environmental Health Department Permit Reference: Wcbc/Pg6/28/Ccv2 Dated: 18th June 1993 Process Type: Local Authority Air Pollution Control Description: PG6/28 Rubber processes Status: Authorised Positional Accuracy: Automatically positioned to the address	A17NE (NW)	862	3	330090 344797
14	Local Authority Pollution Prevention and Controls Name: Bryn Melyn Ltd Location: Unit Ga 05 Gardden Industrial Estate, Ruabon, Wrexham, LL14 6rg Authority: Wrexham County Borough Council, Environmental Health Department Permit Reference: WCBC-PG1-1-1-BM Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input Status: Permitted Positional Accuracy: Manually positioned to the address or location	A17NE (NW)	894	3	330034 344806
	Nearest Surface Water Feature	A13SW (SW)	288	-	330269 343739

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
15	Pollution Incidents to Controlled Waters Property Type: Land Location: Opposite Vaults Inn Authority: Environment Agency, Welsh Region Pollutant: Oils - Other Oil Note: Not Supplied Incident Date: 2nd April 1996 Incident Reference: 28005 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Leakage Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SW (SW)	307	4	330300 343700
15	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Opposite Vaults Inn Authority: Environment Agency, Welsh Region Pollutant: Oils - Other Oil Note: Not Supplied Incident Date: 2nd April 1996 Incident Reference: 28005 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Leakage Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A13SW (SW)	311	4	330300 343695
16	Pollution Incidents to Controlled Waters Property Type: Waste Disposal Tip Location: Downstream Of, Gordden Authority: Environment Agency, Welsh Region Pollutant: Poultry Processing Waste Note: Accidental Spillage/Leakage Incident Date: 21st December 1994 Incident Reference: 22030 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Burst Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A18SW (N)	396	4	330400 344400
17	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, Welsh Region Pollutant: Unknown Note: Not Supplied Incident Date: 7th November 1995 Incident Reference: 26543 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Burst Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12NE (W)	579	4	329850 344100
18	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Down Stream Of Bridge On, Tatham Road Authority: Environment Agency, Welsh Region Pollutant: Crude Sewage Note: Not Supplied Incident Date: 21st May 1992 Incident Reference: 4429 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A12NE (W)	672	4	329800 344250
19	Pollution Incidents to Controlled Waters Property Type: Miscellaneous Premises: Surface Runoff Location: Road Bridge, Upstream Of School Authority: Environment Agency, Welsh Region Pollutant: Farm Effluent/Slurry Note: Not Supplied Incident Date: 4th September 1995 Incident Reference: 25929 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SW (NW)	786	4	329750 344400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	Pollution Incidents to Controlled Waters Property Type: Domestic/Residential Location: RUABON Authority: Environment Agency, Welsh Region Pollutant: Mud/Clay/Soil Note: Weather Incident Date: 31st July 1991 Incident Reference: 3002 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Runoff Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A18NW (N)	822	4	330205 344795
20	Pollution Incidents to Controlled Waters Property Type: Industrial Premises Location: Denis Clay Tip, RUABON Authority: Environment Agency, Welsh Region Pollutant: Farm Land Run-Off Note: Not Supplied Incident Date: 25th January 1992 Incident Reference: 3276 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A18NW (N)	823	4	330200 344795
21	Pollution Incidents to Controlled Waters Property Type: Waste Handling Facilities Location: Garrden Industrial Estate Authority: Environment Agency, Welsh Region Pollutant: Farm Effluent/Slurry Note: Poor Operational Practise Incident Date: 8th April 1992 Incident Reference: 4175 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Direct Discharge Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A17NE (N)	954	4	330100 344900
22	Pollution Incidents to Controlled Waters Property Type: Not Given Location: Llangennech Beach Authority: Environment Agency, Welsh Region Pollutant: Sewage - Septic Tank Effluent Note: Not Supplied Incident Date: 27th January 1997 Incident Reference: 31135 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Direct Discharge Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7SE (SW)	996	4	329980 343090
23	Prosecutions Relating to Authorised Processes Location: Tatham Road, Ruabon, Wrexham, LI14 Prosecution Text: Transporting controlled waste Prosecution Act: Epa90 S34 Hearing Date: 8th May 2008 Verdict: Guilty Fine: 100 Costs: 246 Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	720	4	329791 344340
	River Quality Name: Eitha GQA Grade: River Quality B Reach: Conf.Dee W.Park - Conf.Trib.Nr.Penycae Estimated Distance (km): 6.6 Flow Rate: Flow less than 0.31 cumecs Flow Type: River Year: 2000	A13SW (SW)	392	4	330133 343715

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
24	River Quality Chemistry Sampling Points Name: Eitha Reach: Confluence River Dee West Park To Confluence Tributary Near Penycae Estimated Distance: 6.60 Objective: Not Supplied Positional Accuracy: Located by supplier to within 10m Year: 1990 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 1993 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 1994 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 1995 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 1996 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 1997 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 1998 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 1999 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2000 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2001 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2002 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2003 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2004 GQA Grade: River Quality Chemistry GQA Grade B - Good Compliance: Not Supplied Year: 2005 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 2006 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 2007 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 2008 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied Year: 2009 GQA Grade: River Quality Chemistry GQA Grade A - Very Good Compliance: Not Supplied	A13SW (SW)	290	4	330280 343730
25	Substantiated Pollution Incident Register Authority: Natural Resources Wales Incident Date: 11th May 2013 Incident Reference: 1111914 Water Impact: Category 3 - Minor Incident Air Impact: Category 3 - Minor Incident Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Crude Sewage	A8NW (SW)	603	2	330180 343429
26	Substantiated Pollution Incident Register Authority: Natural Resources Wales Incident Date: 11th September 2006 Incident Reference: 434517 Water Impact: Category 4 - No Impact Air Impact: Category 2 - Significant Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Atmospheric Pollutants and EffectsAmmonia/Amine Odour	A7NE (SW)	706	2	329968 343441

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
27	Substantiated Pollution Incident Register Authority: Natural Resources Wales Incident Date: 15th August 2012 Incident Reference: 1026336 Water Impact: Category 2 - Significant Incident Air Impact: Category 3 - Minor Incident Land Impact: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Crude Sewage	A7NE (SW)	749	2	330076 343319
28	Water Abstractions Operator: Wrexham County Borough Licence Number: 24/67/7/0181 Permit Version: 100 Location: Afon Goch Authority: Environment Agency, Welsh Region Abstraction: Water Supply Related: Effluent/Slurry Dilution Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: River Gwenfro Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 8th February 1974 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18NE (N)	981	4	330760 344930
	Water Abstractions Operator: Mr J Jones Licence Number: 24/67/7/0133 Permit Version: 100 Location: Well Authority: Environment Agency, Welsh Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 24th February 1967 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A15NE (E)	1672	4	332110 344260
	Water Abstractions Operator: Mrs G Price Licence Number: 24/67/7/0183 Permit Version: 100 Location: Well Authority: Environment Agency, Welsh Region Abstraction: General Farming And Domestic Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th April 1978 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A20NE (NE)	1817	4	332110 344750
29	Water Industry Act Referrals Name: Supastrip Ltd Location: SUPASTRIP LTD, PROVIDENCE CHAPEL, BRIDGE STREET, RUABON, RUABON, LL14 6DA Authority: Natural Resources Wales Permit Reference: AU5688 Dated: 18th January 1996 Process Type: Permissions or amendments to discharge under the Water Industry Act 1991 Description: Processes which result in the discharge of Special Category effluents under The Trade Effluents (Prescribed Processes and Substances) Regulations Status: Application received by the EA but is not yet authorised Positional Accuracy: Automatically positioned to the address	A13SW (SW)	372	2	330176 343704

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	Water Industry Act Referrals Name: Robinson Bros (Environmental) Ltd Location: GARDDEN LODGE LANDFILL SITE, RUABON, WREXHAM, CLWYD, LL14 6RD Authority: Natural Resources Wales Permit Reference: AX5099 Dated: 4th October 1996 Process Type: Permissions or amendments to discharge under the Water Industry Act 1991 Description: Processes which result in the discharge of Special Category effluents under The Trade Effluents (Prescribed Processes and Substances) Regulations Status: Application received by the EA but is not yet authorised Positional Accuracy: Manually positioned to the address or location	A18NW (NW)	756	2	330106 344687
	Groundwater Vulnerability Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Map Sheet: Sheet 16 West Cheshire Scale: 1:100,000	A13SE (N)	0	4	330439 343986
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SE (N)	0	2	330439 343986
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13SE (N)	0	2	330439 343986
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
31	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 327.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A13SW (SW)	292	5	330267 343736
32	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A13SW (S)	332	5	330330 343658
33	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 71.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A13SW (S)	333	5	330336 343655
34	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A12SE (W)	353	5	330090 343855

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
35	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A12SE (W)	364	5	330070 343877
36	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 573.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A12SE (W)	367	5	330068 343875
37	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 191.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A8NW (S)	368	5	330383 343606
38	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 423.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A8NE (SE)	514	5	330702 343520
39	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 235.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A8NE (SE)	531	5	330669 343484
40	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 250.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A8NE (S)	539	5	330454 343428
41	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 396.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Black Brook Catchment Name: Dee Primacy: 1	A19SW (NE)	546	5	330852 344367
42	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1302.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A12NE (NW)	630	5	329858 344275
43	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 28.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 2	A12NE (NW)	631	5	329853 344268

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
44	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 28.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A12NE (NW)	634	5	329851 344270
45	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 89.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A8SE (S)	692	5	330547 343283
46	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 275.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A8SE (S)	758	5	330519 343213
47	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A8SE (S)	758	5	330521 343214
48	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 140.5 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A9NW (SE)	778	5	331030 343450
49	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 40.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A18NE (NE)	784	5	330755 344720
50	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 38.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Black Brook Catchment Name: Dee Primacy: 1	A18NE (N)	799	5	330740 344743
51	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A18NE (N)	836	5	330763 344774
52	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 254.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Black Brook Catchment Name: Dee Primacy: 1	A18NE (N)	836	5	330763 344774

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
53	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 40.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A7SE (SW)	864	5	330014 343222
54	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 50.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A8SW (S)	868	5	330396 343101
55	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 1.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A7SE (SW)	875	5	330043 343193
56	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 184.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A7SE (SW)	875	5	330044 343193
57	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 11.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A7SE (SW)	875	5	330044 343193
58	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 94.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A9NE (SE)	883	5	331170 343457
59	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 142.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NW (N)	885	5	330170 344851
60	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 31.9 Watercourse Level: Underground Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NW (N)	885	5	330170 344851
61	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 164.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NW (N)	896	5	330195 344870

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
62	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 168.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A8SW (S)	906	5	330360 343067
63	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 164.3 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NW (N)	932	5	330343 344933
64	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 154.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A9NE (SE)	937	5	331272 343518
65	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 20.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NE (N)	941	5	330521 344943
66	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 54.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NE (N)	941	5	330526 344942
67	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 99.0 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A8SW (S)	944	5	330175 343065
68	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 26.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NE (N)	962	5	330572 344957
69	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 291.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Goch Catchment Name: Dee Primacy: 1	A18NE (N)	972	5	330598 344963
70	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 82.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Dee Primacy: 1	A9NE (SE)	977	5	331316 343515

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
71	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1154.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Afon Eitha Catchment Name: Dee Primacy: 1	A8SW (S)	999	5	330240 342991

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
72	Historical Landfill Sites Licence Holder: Shanks and McEwan Northern Limited Location: Gardden Lodge, Tatham Road, Ruabon, Wrexham, Clywd Name: Gardden Clay Pit Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD14778 First Input Date: 31st December 1977 Last Input Date: 31st August 1984 Specified Waste: Deposited Waste included Industrial, Commercial and Household Waste Type: EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 6955/0028 BGS Ref: Not Supplied Other Ref: WMBC L/23, WMBC L82	A13NW (NW)	243	2	330292 344204
73	Historical Landfill Sites Licence Holder: C A Hughes Location: Tatham Road, Wrexham, Ruabon Name: Lllys Offa Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD14757 First Input Date: 2nd June 1983 Last Input Date: 2nd June 1984 Specified Waste: Deposited Waste included Industrial Waste Type: EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 6955/0034 BGS Ref: Not Supplied Other Ref: WMBC L/29	A12NE (W)	619	2	329845 344221
74	Licensed Waste Management Facilities (Landfill Boundaries) Name: Gardden Claypit 2 Northern Licence Number: 37109 Location: Tatham Road, Ruabon, Wrexham, Clywd, LL14 6RF Licence Holder: Shanks Northern Ltd Authority: Natural Resources Wales Site Category: Household, Commercial And Industrial Waste Landfills Max Input Rate: Not Supplied Licence Status: Closure Issued: 6th July 1994 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied	A13NW (NW)	228	2	330286 344181
75	Licensed Waste Management Facilities (Landfill Boundaries) Name: Gardden Claypit 1 Midlands Licence Number: 37014 Location: Gardden, Tatham Road, Ruabon, Wrexham, Clywd, LL14 6RF Licence Holder: Shanks Midlands Ltd Authority: Natural Resources Wales Site Category: Household, Commercial And Industrial Waste Landfills Max Input Rate: Not Supplied Licence Status: Closure Issued: 2nd May 1989 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied	A18SW (NW)	393	2	330226 344340
76	Licensed Waste Management Facilities (Locations) Licence Number: BP3494FC Location: Gardden Claypit 1 Midlands, Gardden, Ruabon, Wrexham, Clywd, Wrexham, LL14 6RF Operator Name: Shanks Midlands Ltd Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Not Supplied Licence Status: Effective Issued: 2nd May 1989 Last Modified: Not Supplied Expires: 25th January 2002 Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	790	2	330087 344716

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
76	Licensed Waste Management Facilities (Locations) Licence Number: 37014 Location: Gardden, Tatham Road, Ruabon, Wrexham, LL14 6RF Operator Name: Shanks Midlands Ltd Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Household, Commercial And Industrial Waste Landfills Licence Status: Closed Issued: 2nd May 1989 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	790	2	330087 344716
76	Licensed Waste Management Facilities (Locations) Licence Number: HP3694FJ Location: Gardden Claypit 2 Northern, Wrexham, Clwyd, Wrexham, LL14 6RF Operator Name: Shanks Northern Ltd Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Not Supplied Licence Status: Effective Issued: 6th July 1994 Last Modified: Not Supplied Expires: 25th January 2002 Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	800	2	330077 344722
76	Licensed Waste Management Facilities (Locations) Licence Number: 37109 Location: Tatham Road, Ruabon, Wrexham, LL14 6RF Operator Name: Shanks Northern Ltd Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Household, Commercial And Industrial Waste Landfills Licence Status: Closed Issued: 6th July 1994 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	800	2	330077 344722
77	Licensed Waste Management Facilities (Locations) Licence Number: VP3394FX Location: Clwyd Car Breakers, Ruabon, Wrexham, Clwyd, Wrexham, LL14 6RG Operator Name: D Bennett Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Not Supplied Licence Status: Expired Issued: 31st March 1999 Last Modified: Not Supplied Expires: 25th July 2010 Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (N)	1000	2	330083 344942
77	Licensed Waste Management Facilities (Locations) Licence Number: 37163 Location: Land / Premises At, Gardden Ind Est, Ruabon, Wrexham, Clwyd, LL14 6RG Operator Name: Bennett D Operator Location: Not Supplied Authority: Natural Resources Wales Site Category: Metal Recycling Sites (Mixed) Licence Status: Expired Issued: 31st March 1999 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (N)	1000	2	330083 344942

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Local Authority Landfill Coverage Name: Wrexham County Borough Council - Has supplied landfill data		0	6	330439 343986
78	Potentially Infilled Land (Non-Water) Bearing Ref: N Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1993	A18SW (N)	330	9	330369 344329
79	Potentially Infilled Land (Non-Water) Bearing Ref: N Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1993	A18SW (N)	401	9	330315 344389
80	Potentially Infilled Land (Non-Water) Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1993	A18SW (NW)	471	9	330182 344404
81	Potentially Infilled Land (Non-Water) Bearing Ref: N Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1976	A18SW (N)	627	9	330259 344608
82	Potentially Infilled Land (Non-Water) Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1995	A7NW (SW)	871	9	329668 343542
83	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1900	A13NE (N)	187	9	330495 344182
84	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1879	A13NE (N)	223	9	330451 344227
85	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1954	A8NW (S)	365	9	330374 343611
86	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1954	A14SW (SE)	532	9	330882 343658
87	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1879	A8NE (S)	567	9	330486 343402
88	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1879	A7NE (SW)	697	9	329970 343451
89	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1879	A9NW (SE)	746	9	330995 343460
90	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1954	A9NE (SE)	960	9	331158 343320

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
91	Registered Landfill Sites Licence Holder: Shanks & Mc Ewan (Northern) Ltd Licence Reference: NOW-511-L (L82) Site Location: Gardden Claypit, Tatham Road, Ruabon, Wrexham, Clwyd Licence Easting: 330200 Licence Northing: 344300 Operator Location: A8 Edinburgh Road, COATBRIDGE, North Lanarkshire, ML5 4UG Authority: Environment Agency Wales, North Area Site Category: Landfill Max Input Rate: Very Large (Equal to or greater than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Operational as far as is known Dated: 1st June 1997 Preceded By: Now-511-L (L82) Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Constr/Demol/Excav. Wastes Difficult Wastes (As In Wmp.26) Household & Commercial Waste Industrial Wastes Max.Total Waste Input Daily Tyres, If Shredded Prohibited Waste: Animal Carcasses/Offal Clinical Wastes Difficult Wastes (As In Wmp.26) N.O.S. Liquid Wastes Liquified Gas / Gas Under Pressure Poisonous, Noxious, Polluting Wastes Special Wastes (As In '96 Regs) Sub'S Control. Radioactive Subs Act'60 Waste Contain.Viable Path.Organisms Waste In Drums Waste N.O.S.	A13NW (NW)	375	4	330200 344300
91	Registered Landfill Sites Licence Holder: Shanks & Mc Ewan (Northern) Ltd Licence Reference: Now-511-L (L82) Site Location: Gardden Claypit, Tatham Road, Ruabon, Wrexham, Clwyd Licence Easting: 330200 Licence Northing: 344300 Operator Location: A8 Edinburgh Road, COATBRIDGE, North Lanarkshire, ML5 4UG Authority: Environment Agency Wales, North Area Site Category: Landfill Max Input Rate: Very Large (Equal to or greater than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Record superseded Dated: 1st July 1994 Preceded By: NOW-509-L (L50) Licence: Superseded By: NOW-511-L (L82) Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Asbestos, Bonded/Cemented Only Constr/Demol/Excav. Wastes Difficult Wastes (As In Wmp.26) Household & Commercial Waste Industrial Wastes Max.Total Waste Input Daily Tyres, If Shredded Prohibited Waste: Animal Carcasses/Offal Clinical Wastes Difficult Wastes (As In Wmp.26) N.O.S. Liquid Wastes Liquified Gas / Gas Under Pressure Poisonous, Noxious, Polluting Wastes Special Wastes Sub'S Control. Radioactive Subs Act'60 Waste Contain.Viable Path.Organisms Waste In Drums Waste N.O.S.	A13NW (NW)	375	4	330200 344300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
91	Registered Landfill Sites Licence Holder: Shanks & Mc Ewan Licence Reference: L23 Site Location: Gardden Lodge Clay Pit, Tatham Road, Ruabon, Wrexham, Clwyd Licence Easting: 330200 Licence Northing: 344300 Operator Location: Pen Y Bont Works, Chirk, Clwyd Authority: Environment Agency Wales, North Area Site Category: Landfill Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st July 1977 Preceded By: Not Given Licence: Superseded By: Now-511-L (L82) Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Glassfibre Manufacturing & Fly Waste	A13NW (NW)	375	4	330200 344300
92	Registered Landfill Sites Licence Holder: Shanks & Mc Ewan (Midlands) Ltd Licence Reference: NOW-509-L (L50) Site Location: Gardden Clay Pit, Tatham Road, Ruabon, WREXHAM, Clwyd, LL14 6RF Licence Easting: 330200 Licence Northing: 344500 Operator Location: Weldon Road, CORBY, Northamptonshire, NN18 8AP Authority: Environment Agency Wales, North Area Site Category: Landfill Max Input Rate: Large (Equal to or greater than 75,000 and less than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Operational as far as is knownOperational Dated: 1st June 1997 Preceded By: NOW-509-L (L50) Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Excavation Waste House, Com + Ind.Waste Max.Waste For Licences L50 + L82 Shredded Tyres Prohibited Waste: Clinical Wastes Drummed Waste Liable To Cause Environmental Hazards Special Wastes (As In '96 Regs) Water Soluble Ind. Waste	A18SW (NW)	547	4	330200 344500
92	Registered Landfill Sites Licence Holder: Shanks & Mc Ewan (Midlands) Ltd Licence Reference: NOW-509-L (L50) Site Location: Gardden Clay Pit, Tatham Road, Ruabon, WREXHAM, Clwyd, LL14 6RF Licence Easting: 330200 Licence Northing: 344500 Operator Location: Weldon Road, CORBY, Northamptonshire, NN18 8AP Authority: Environment Agency Wales, North Area Site Category: Landfill Max Input Rate: Large (Equal to or greater than 75,000 and less than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Record supersededSuperseded Dated: 1st May 1989 Preceded By: Not Given Licence: Superseded By: NOW-509-L (L50) Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Bonded Asbestos Products Construction And Demolition Wastes Excavation Waste House, Com + Ind.Waste Max.Waste For Licences L50 + L82 Shredded Tyres Prohibited Waste: Clinical Wastes Drummed Waste Liable To Cause Environmental Hazards Special Wastes N.O.S. Water Soluble Ind. Waste	A18SW (NW)	547	4	330200 344500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
93	Registered Landfill Sites Licence Holder: C A Hughes Licence Reference: L29 Site Location: Llys Offa, Ruabon, Wrexham, Clwyd Licence Easting: 329820 Licence Northing: 344260 Operator Location: As Site Address Authority: Environment Agency Wales, North Area Site Category: Landfill Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st June 1980 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Brick, Rubble (Demol'n Waste) Topsoil	A12NE (NW)	658	4	329820 344260

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Warwickshire Group	A13SE (N)	0	1	330439 343986
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SE (N)	0	1	330439 343986
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13SW (SW)	290	1	330233 343762
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SW (NW)	428	1	330152 344329
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14SW (E)	458	1	330913 343914
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A12NE (W)	553	1	329865 344000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NE (W)	555	1	329863 344021

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18SW (N)	558	1	330238 344528
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NE (W)	561	1	329859 344032
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12SE (W)	612	1	329834 343802
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A12NW (W)	678	1	329749 344098
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: <15 mg/kg	A17SE (NW)	710	1	329814 344360
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18NW (N)	741	1	330392 344746

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 40 - 60 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18NW (N)	884	1	330268 344874
94	BGS Recorded Mineral Sites Site Name: New Hall Location: Ruabon, Wrexham, Denbighshire Source: British Geological Survey, National Geoscience Information Service Reference: 185624 Type: Underground Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Etruria Formation Commodity: Vein Minerals Positional Accuracy: Located by supplier to within 10m	A18SW (N)	405	1	330312 344392
95	BGS Recorded Mineral Sites Site Name: Gardden Location: Ruabon, Wrexham, Denbighshire Source: British Geological Survey, National Geoscience Information Service Reference: 4743 Type: Opencast Status: Ceased Operator: Shanks And Mcewan (Midlands) Ltd. Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Etruria Formation (Ruabon Marl Formation) Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 100m	A18SW (NW)	547	1	330200 344500
96	BGS Recorded Mineral Sites Site Name: Tatham Brick & Tile Works Location: Ruabon, Wrexham, Denbighshire Source: British Geological Survey, National Geoscience Information Service Reference: 185656 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Etruria Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	548	1	330091 344434
97	BGS Recorded Mineral Sites Site Name: Tatham Brick & Terra Cotta Works Location: Ruabon, Wrexham, Denbighshire Source: British Geological Survey, National Geoscience Information Service Reference: 185655 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Etruria Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A18NW (N)	789	1	330164 344747
98	BGS Recorded Mineral Sites Site Name: Terra-Cotta Brick & Tile Works Location: Ruabon, Wrexham, Denbighshire Source: British Geological Survey, National Geoscience Information Service Reference: 185623 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Etruria Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A18NW (N)	824	1	330345 344825

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
99	BGS Recorded Mineral Sites Site Name: Pentre-Clawdd Quarry Location: Ruabon, Clwyd Source: British Geological Survey, National Geoscience Information Service Reference: 17548 Type: Opencast Status: Ceased Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Carboniferous Geology: Halesowen Formation Commodity: Sandstone Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	936	1	331310 344380
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas Description: In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	A13SE (N)	0	7	330439 343986
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13SE (N)	0	-	330439 343986
	Non Coal Mining Areas of Great Britain Risk: Rare Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (W)	171	1	330255 344040
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SW (W)	98	1	330320 343978
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	110	1	330551 344050
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NW (NW)	117	1	330363 344099
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (NE)	246	1	330624 344171
	Radon Potential - Radon Affected Areas Affected Area: The property is an Intermediate probability radon area (3 to 5% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Radon Potential - Radon Protection Measures Protection Measure: Basic radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13SE (N)	0	1	330439 343986

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
100	Contemporary Trade Directory Entries Name: N Blake Location: Maes y Llan Farm, Maes y Llan Lane, Ruabon, Wrexham, Clwyd, LL14 6AD Classification: Pet Foods & Animal Feeds Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SE (SE)	127	-	330570 343924
101	Contemporary Trade Directory Entries Name: Abacus Retail Equipment Location: 4, Wynnstey Mews, Bridge Street, Ruabon, Wrexham, Clwyd, LL14 6BU Classification: Cash Registers & Check-Out Equipment Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (SW)	261	-	330304 343750
101	Contemporary Trade Directory Entries Name: Supa Strip Location: Providence Chapel, Tan-y-Lan, Ruabon, Wrexham, Clwyd, LL14 6DB Classification: Paint & Varnish Stripping Status: Inactive Positional Accuracy: Automatically positioned to the address	A13SW (SW)	297	-	330293 343715
102	Contemporary Trade Directory Entries Name: Affordable Blinds Location: 25, East Avenue, Ruabon, Wrexham, Clwyd, LL14 6BG Classification: Blinds, Awnings & Canopies Status: Inactive Positional Accuracy: Automatically positioned to the address	A18SW (N)	401	-	330430 344406
103	Contemporary Trade Directory Entries Name: Pbm Location: 15, Spinney Walk, Ruabon, Wrexham, Clwyd, LL14 6TE Classification: Road Haulage Services Status: Inactive Positional Accuracy: Automatically positioned to the address	A7NE (SW)	535	-	330092 343561
104	Contemporary Trade Directory Entries Name: Clean 4 U Location: Wats Dyke View, Ruabon, Wrexham, Clwyd, LL14 6BN Classification: Cleaning Services - Domestic Status: Inactive Positional Accuracy: Automatically positioned to the address	A18SE (N)	559	-	330627 344529
105	Contemporary Trade Directory Entries Name: Ainscough Group Ltd Location: Gardden View, Ruabon, Wrexham, Clwyd, LL14 6PS Classification: Crane Hire, Sales & Service Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location	A18SW (N)	585	-	330344 344584
106	Contemporary Trade Directory Entries Name: Esso Location: Ruabon by Pass, Ruabon, Wrexham, Clwyd, LL14 6YY Classification: Petrol Filling Stations Status: Inactive Positional Accuracy: Automatically positioned to the address	A19SW (NE)	693	-	330885 344535
106	Contemporary Trade Directory Entries Name: Esso Location: Ruabon by Pass, Ruabon, Wrexham, Clwyd, LL14 6YY Classification: Petrol Filling Stations Status: Active Positional Accuracy: Automatically positioned to the address	A19SW (NE)	693	-	330885 344535
106	Contemporary Trade Directory Entries Name: Ruabon Service Station Location: Ruabon By Pass, Ruabon, Wrexham, Clwyd, LL14 6YY Classification: Petrol Filling Stations Status: Active Positional Accuracy: Automatically positioned to the address	A19SW (NE)	693	-	330885 344535
106	Contemporary Trade Directory Entries Name: Total Location: Ruabon By Pass, Ruabon, Wrexham, Clwyd, LL14 6YY Classification: Petrol Filling Stations Status: Inactive Positional Accuracy: Automatically positioned to the address	A19SW (NE)	693	-	330885 344535
107	Contemporary Trade Directory Entries Name: Johnstown & Ruabon Tyres Location: Wrexham, LL14 6RG Classification: Tyre Dealers Status: Active Positional Accuracy: Automatically positioned to the address	A17NE (NW)	828	-	330044 344737

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
107	Contemporary Trade Directory Entries Name: New Dubs Location: Gardden Ind Est, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Classic Car Specialists Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	A17NE (NW)	843	-	330054 344758
108	Contemporary Trade Directory Entries Name: Wrexham Electrical Repairs Ltd Location: Gardden Industrial Estate, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Electric Motor Sales & Service Status: Active Positional Accuracy: Automatically positioned to the address	A17NE (N)	892	-	330091 344830
108	Contemporary Trade Directory Entries Name: Johnstown & Ruabon Location: Gardden Ind Est, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Tyre Dealers Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	A17NE (N)	893	-	330091 344830
108	Contemporary Trade Directory Entries Name: Bodyworx Location: Unit 2 Gardden Ind Est, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Car Body Repairs Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	A17NE (NW)	914	-	330064 344842
108	Contemporary Trade Directory Entries Name: Wrexham Motor Co Location: Gardden Industrial Estate, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Car Dealers - Used Status: Active Positional Accuracy: Automatically positioned to the address	A17NE (N)	922	-	330099 344865
109	Contemporary Trade Directory Entries Name: Bryn Melyn Ltd Location: Gardden Industrial Estate, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Bus & Coach Operators & Stations Status: Inactive Positional Accuracy: Automatically positioned to the address	A17NE (NW)	894	-	330034 344806
110	Contemporary Trade Directory Entries Name: Ainscough Group Ltd Location: Gardden Ind Est, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Crane Hire, Sales & Service Status: Inactive Positional Accuracy: Manually positioned within the geographical locality	A17NE (NW)	931	-	330074 344864
110	Contemporary Trade Directory Entries Name: Clwyd Compounders Ltd Location: Gardden Industrial Estate, Ruabon, WREXHAM, Clwyd, LL14 6RG Classification: Rubber & Plastic Products - Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address	A17NE (NW)	974	-	330036 344896
111	Contemporary Trade Directory Entries Name: Rockrite Ltd Location: Vauxhall Industrial Estate, Ruabon, Wrexham, Clwyd, LL14 6HA Classification: Mortar Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address	A18NW (N)	969	-	330419 344974
112	Contemporary Trade Directory Entries Name: Clwyd Breakers Ltd Location: Gardden Industrial Estate, Ruabon, Wrexham, Clwyd, LL14 6RG Classification: Car Breakers & Dismantlers Status: Active Positional Accuracy: Automatically positioned to the address	A17NE (N)	991	-	330100 344939
113	Contemporary Trade Directory Entries Name: Travis Perkins Plc Location: Ruabon Road, Ruabon, Wrexham, LL14 6RA Classification: Builders' Merchants Status: Active Positional Accuracy: Automatically positioned to the address	A18NW (N)	993	-	330213 344974

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
114	Fuel Station Entries Name: Victoria Garage Location: B5605 , Ruabon , Wrexham, Wrexham, LL14 3RS Brand: Obsolete Premises Type: Not Applicable Status: Obsolete Positional Accuracy: Manually positioned to the address or location	A13NW (NW)	0	-	330436 343988
115	Fuel Station Entries Name: Rss Ruabon Service Area Location: Ruabon Bypass , Ruabon , Wrexham, Wrexham, LL14 6YY Brand: Esso Premises Type: Service Area Status: Open Positional Accuracy: Automatically positioned to the address	A19SW (NE)	693	-	330885 344535
116	Points of Interest - Commercial Services Name: Rss Ruabon Service Area Location: Ruabon By Pass, Ruabon, Wrexham, LL14 6YY Category: Personal, Consumer and other Services Class Code: Vehicle Cleaning Services Positional Accuracy: Positioned to address or location	A19SW (NE)	692	8	330885 344534
116	Points of Interest - Commercial Services Name: Car Wash Location: Ruabon by Pass, Ruabon, Wrexham, LL14 6YY Category: Personal, Consumer and other Services Class Code: Vehicle Cleaning Services Positional Accuracy: Positioned to address or location	A19SW (NE)	693	8	330885 344535
117	Points of Interest - Commercial Services Name: Scrap Yard Location: LL14 Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A18NW (N)	870	8	330118 344816
118	Points of Interest - Commercial Services Name: H K Motors Location: 1 Gardden Industrial Estate, Ruabon, Wrexham, LL14 6RG Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A17NE (N)	933	8	330083 344870
118	Points of Interest - Commercial Services Name: Clwyd Breakers Ltd Location: Gardden Industrial Estate, Ruabon, Wrexham, LL14 6RG Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A17NE (N)	991	8	330099 344938
118	Points of Interest - Commercial Services Name: Scrap Yard Location: LL14 Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A18NW (N)	994	8	330112 344946
119	Points of Interest - Commercial Services Name: C J C Motor Services Location: Pen Y Gardden, Ruabon, Wrexham, Clwyd, LL14 6RE Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A17NW (NW)	967	8	329742 344682
120	Points of Interest - Manufacturing and Production Name: Gardden Industrial Estate Location: LL14 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location	A17NE (N)	940	8	330087 344879
121	Points of Interest - Public Infrastructure Name: Garden of Rest Location: Not Supplied Category: Infrastructure and Facilities Class Code: Cemeteries and Crematoria Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	228	8	330216 343879

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
121	Points of Interest - Public Infrastructure Name: Garden of Rest Location: LL14 Category: Infrastructure and Facilities Class Code: Cemeteries and Crematoria Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	243	8	330201 343876
122	Points of Interest - Public Infrastructure Name: Cemetery Location: Not Supplied Category: Infrastructure and Facilities Class Code: Cemeteries and Crematoria Positional Accuracy: Positioned to an adjacent address or location	A13NW (W)	307	8	330126 344083
122	Points of Interest - Public Infrastructure Name: Cemetery Location: LL14 Category: Infrastructure and Facilities Class Code: Cemeteries and Crematoria Positional Accuracy: Positioned to an adjacent address or location	A13NW (W)	322	8	330110 344081
123	Points of Interest - Public Infrastructure Name: Ruabon Rail Station Location: Station Road (Ffordd Yr Orsaf), LL14 Category: Public Transport, Stations and Infrastructure Class Code: Railway Stations, Junctions and Halts Positional Accuracy: Positioned to address or location	A12SE (SW)	392	8	330062 343820
123	Points of Interest - Public Infrastructure Name: Ruabon Station Location: Station Road (Ffordd Yr Orsaf), LL14 Category: Public Transport, Stations and Infrastructure Class Code: Railway Stations, Junctions and Halts Positional Accuracy: Positioned to address or location	A12SE (SW)	392	8	330062 343820
124	Points of Interest - Public Infrastructure Name: Refuse Tip Location: LL14 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location	A18SW (NW)	535	8	330155 344463
125	Points of Interest - Public Infrastructure Name: Ruabon Service Station Location: Ruabon by Pass, Ruabon, Wrexham, LL14 6YY Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A19SW (NE)	692	8	330885 344534
125	Points of Interest - Public Infrastructure Name: Esso Location: Ruabon by Pass, Ruabon, Wrexham, LL14 6YY Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A19SW (NE)	692	8	330885 344534
125	Points of Interest - Public Infrastructure Name: Ruabon Service Area Location: Ruabon by Pass, Ruabon, Wrexham, LL14 6YY Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A19SW (NE)	693	8	330885 344535
125	Points of Interest - Public Infrastructure Name: Esso Location: Ruabon by Pass, Ruabon, Wrexham, LL14 6YY Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A19SW (NE)	693	8	330885 344535
125	Points of Interest - Public Infrastructure Name: Ruabon Service Area Location: Ruabon by Pass, Ruabon, Wrexham, LL14 6YY Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A19SW (NE)	693	8	330885 344535
125	Points of Interest - Public Infrastructure Name: Rss Ruabon Service Area Location: Ruabon by Pass, Ruabon, Wrexham, LL14 6YY Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A19SW (NE)	693	8	330885 344535

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
126	Points of Interest - Public Infrastructure Name: Sluice Location: LL14 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A9NW (SE)	735	8	330974 343453
127	Points of Interest - Public Infrastructure Name: Weir Location: LL14 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	841	8	329687 344402
128	Points of Interest - Public Infrastructure Name: Sluice Location: LL14 Category: Water Class Code: Weirs, Sluices and Dams Positional Accuracy: Positioned to an adjacent address or location	A8SW (S)	856	8	330431 343112
129	Points of Interest - Public Infrastructure Name: Bryn Melyn Ltd Location: Gardden Industrial Estate, Ruabon, Wrexham, LL14 6RG Category: Public Transport, Stations and Infrastructure Class Code: Bus and Coach Stations, Depots and Companies Positional Accuracy: Positioned to address or location	A17NE (NW)	894	8	330034 344806
130	Points of Interest - Recreational and Environmental Name: Play Area Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	82	8	330432 343888
131	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A18SE (N)	657	8	330483 344660
132	Points of Interest - Recreational and Environmental Name: Playground Location: Llangollen Road (Ffordd Llangollen), LL14 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A7NE (SW)	708	8	329811 343620
133	Points of Interest - Recreational and Environmental Name: Playground Location: Pont Adam Crescent, LL14 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	725	8	329750 343703
133	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	726	8	329748 343704

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
134	Ancient Woodland Name: Not Supplied Reference: 29690 Area(m²): 10433.36 Type: Restored Ancient Woodland Site	A13SW (S)	301	2	330390 343673
135	Ancient Woodland Name: Not Supplied Reference: 36787 Area(m²): 3260.5 Type: Restored Ancient Woodland Site	A8NE (S)	402	2	330514 343571
136	Ancient Woodland Name: Not Supplied Reference: 36786 Area(m²): 1485.65 Type: Restored Ancient Woodland Site	A8NW (S)	440	2	330336 343543
137	Ancient Woodland Name: Not Supplied Reference: 36789 Area(m²): 8778.75 Type: Restored Ancient Woodland Site	A14NW (E)	471	2	330907 344138
138	Ancient Woodland Name: Not Supplied Reference: 36784 Area(m²): 5946.51 Type: Restored Ancient Woodland Site	A8NW (S)	480	2	330412 343489
139	Ancient Woodland Name: Not Supplied Reference: 47038 Area(m²): 5404.8 Type: Plantation on Ancient Woodland	A8NE (S)	480	2	330488 343489
140	Ancient Woodland Name: Not Supplied Reference: 31869 Area(m²): 41528.19 Type: Ancient and Semi-Natural Woodland	A14NW (NE)	507	2	330909 344224
141	Ancient Woodland Name: Not Supplied Reference: 45170 Area(m²): 77093.16 Type: Plantation on Ancient Woodland	A8NE (S)	522	2	330564 343458
142	Ancient Woodland Name: Not Supplied Reference: 29689 Area(m²): 3670.22 Type: Restored Ancient Woodland Site	A8NW (S)	561	2	330434 343407
143	Ancient Woodland Name: Not Supplied Reference: 31868 Area(m²): 5891.96 Type: Ancient and Semi-Natural Woodland	A7NE (SW)	576	2	329953 343645
144	Ancient Woodland Name: Not Supplied Reference: 45170 Area(m²): 940.57 Type: Plantation on Ancient Woodland	A8SE (S)	721	2	330469 343247
145	Ancient Woodland Name: Not Supplied Reference: 34277 Area(m²): 5006.35 Type: Ancient and Semi-Natural Woodland	A7NW (SW)	798	2	329746 343554
146	Ancient Woodland Name: Not Supplied Reference: 31870 Area(m²): 45784.57 Type: Ancient and Semi-Natural Woodland	A17SW (NW)	836	2	329716 344441
147	Ancient Woodland Name: Not Supplied Reference: 31867 Area(m²): 13464.64 Type: Ancient and Semi-Natural Woodland	A9SW (SE)	856	2	330814 343193

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
148	Ancient Woodland Name: Not Supplied Reference: 31871 Area(m²): 30451.88 Type: Ancient and Semi-Natural Woodland	A17NE (NW)	924	2	329810 344688
149	Ancient Woodland Name: Not Supplied Reference: 29689 Area(m²): 16872.93 Type: Restored Ancient Woodland Site	A8SW (S)	942	2	330174 343067
150	Ancient Woodland Name: Not Supplied Reference: 36790 Area(m²): 3231.92 Type: Restored Ancient Woodland Site	A18NW (N)	998	2	330138 344959

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Wrexham County Borough Council - Public Protection Department Oswestry Borough Council (now part of Shropshire Council) - Environmental Health Department Denbighshire County Council - Public Protection Department Shropshire Council - Environmental Health Department North Shropshire District Council (now part of Shropshire Council) - Environmental Health Department	April 2016 December 2008 January 2015 March 2015 October 2008	Annually Not Applicable Annual Rolling Update Annually Not Applicable
Discharge Consents Environment Agency - Welsh Region Natural Resources Wales	August 2014 January 2019	Quarterly Quarterly
Enforcement and Prohibition Notices Environment Agency - Midlands Region Environment Agency - Welsh Region	March 2013 March 2013	Annual Rolling Update Annual Rolling Update
Integrated Pollution Controls Environment Agency - Midlands Region Environment Agency - Welsh Region	October 2008 October 2008	Variable Variable
Integrated Pollution Prevention And Control Environment Agency - Midlands Region Environment Agency - Welsh Region Natural Resources Wales	January 2019 January 2019 January 2019	Quarterly Quarterly Quarterly
Local Authority Integrated Pollution Prevention And Control Wrexham County Borough Council - Environmental Health Department North Shropshire District Council (now part of Shropshire Council) - Environmental Health Department Denbighshire County Council - Environmental Health Department Shropshire Council - Environmental Health Department Oswestry Borough Council (now part of Shropshire Council) - Environmental Health Department	April 2014 June 2008 March 2013 October 2014 September 2008	Variable Not Applicable Variable Variable Not Applicable
Local Authority Pollution Prevention and Controls Wrexham County Borough Council - Environmental Health Department Denbighshire County Council - Environmental Health Department North Shropshire District Council (now part of Shropshire Council) - Environmental Health Department Shropshire Council - Environmental Health Department Oswestry Borough Council (now part of Shropshire Council) - Environmental Health Department	April 2014 December 2014 June 2008 October 2014 September 2008	Annual Rolling Update Annual Rolling Update Not Applicable Annually Not Applicable
Local Authority Pollution Prevention and Control Enforcements Wrexham County Borough Council - Environmental Health Department Denbighshire County Council - Environmental Health Department North Shropshire District Council (now part of Shropshire Council) - Environmental Health Department Shropshire Council - Environmental Health Department Oswestry Borough Council (now part of Shropshire Council) - Environmental Health Department	April 2014 December 2014 June 2008 October 2014 September 2008	Variable Variable Not Applicable Variable Not Applicable
Nearest Surface Water Feature Ordnance Survey	September 2017	
Pollution Incidents to Controlled Waters Environment Agency - Welsh Region	December 1998	Not Applicable
Prosecutions Relating to Authorised Processes Environment Agency - Midlands Region Environment Agency - Welsh Region Natural Resources Wales	July 2015 March 2013 March 2013	Annual Rolling Update Annual Rolling Update Annual Rolling Update

Agency & Hydrological	Version	Update Cycle
Prosecutions Relating to Controlled Waters Environment Agency - Midlands Region Environment Agency - Welsh Region Natural Resources Wales	March 2013 March 2013 March 2013	Annual Rolling Update Annual Rolling Update Annual Rolling Update
Registered Radioactive Substances Natural Resources Wales Environment Agency - Midlands Region Environment Agency - Welsh Region	January 2015 June 2016 June 2016	Annually
River Quality Environment Agency - Head Office	November 2001	Not Applicable
River Quality Chemistry Sampling Points Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register Environment Agency - Midlands Region - Upper Severn Area Environment Agency - Midlands Region - West Area Environment Agency Wales - North Area Natural Resources Wales	January 2019 January 2019 January 2019 October 2018	Quarterly Quarterly Quarterly Quarterly
Water Abstractions Natural Resources Wales Environment Agency - Welsh Region	February 2019 January 2019	Quarterly Quarterly
Water Industry Act Referrals Natural Resources Wales Environment Agency - Midlands Region Environment Agency - Welsh Region	January 2019 October 2017 October 2017	Quarterly Quarterly Quarterly
Groundwater Vulnerability Environment Agency - Head Office	April 2015	Not Applicable
Drift Deposits Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations Natural Resources Wales	January 2018	Annually
Superficial Aquifer Designations Natural Resources Wales	January 2018	Annually
Source Protection Zones Natural Resources Wales	November 2016	Annual Rolling Update
Extreme Flooding from Rivers or Sea without Defences Natural Resources Wales	February 2018	Quarterly
Flooding from Rivers or Sea without Defences Natural Resources Wales	February 2018	Quarterly
Areas Benefiting from Flood Defences Natural Resources Wales	February 2018	Quarterly
Flood Water Storage Areas Natural Resources Wales	February 2018	Quarterly
Flood Defences Natural Resources Wales	November 2018	Quarterly
OS Water Network Lines Ordnance Survey	October 2018	Quarterly
Surface Water 1 in 30 year Flood Extent Natural Resources Wales	October 2013	Annually
Surface Water 1 in 100 year Flood Extent Natural Resources Wales	October 2013	Annually
Surface Water 1 in 1000 year Flood Extent Natural Resources Wales	October 2013	Annually

Agency & Hydrological	Version	Update Cycle
Surface Water Suitability Natural Resources Wales	October 2013	Annually
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites Natural Resources Wales	July 2017	Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - Midlands Region Environment Agency - Welsh Region	October 2008 October 2008	Not Applicable Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - Midlands Region - Upper Severn Area Environment Agency - Midlands Region - West Area Environment Agency Wales - North Area Natural Resources Wales	July 2018 July 2018 July 2018 July 2018	Quarterly Quarterly Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - Midlands Region - Upper Severn Area Environment Agency - Midlands Region - West Area Environment Agency Wales - North Area Natural Resources Wales	January 2019 January 2019 January 2019 January 2019	Quarterly Quarterly Quarterly Quarterly
Local Authority Landfill Coverage Denbighshire County Council - Environmental Health Department North Shropshire District Council (now part of Shropshire Council) Oswestry Borough Council (now part of Shropshire Council) - Environmental Health Department Shropshire County Council (now part of Shropshire Council) - Shropshire Records And Research Centre Wrexham County Borough Council	May 2000 May 2000 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Wrexham County Borough Council Denbighshire County Council - Environmental Health Department North Shropshire District Council (now part of Shropshire Council) Oswestry Borough Council (now part of Shropshire Council) - Environmental Health Department Shropshire County Council (now part of Shropshire Council) - Shropshire Records And Research Centre	June 2003 May 2000 May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable
Potentially Infilled Land (Non-Water) Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water) Landmark Information Group Limited	December 1999	Not Applicable
Registered Landfill Sites Environment Agency - Midlands Region - Upper Severn Area Environment Agency - Midlands Region - West Area Environment Agency Wales - North Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable
Registered Waste Transfer Sites Environment Agency - Midlands Region - Upper Severn Area Environment Agency - Midlands Region - West Area Environment Agency Wales - North Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency - Midlands Region - Upper Severn Area Environment Agency - Midlands Region - West Area Environment Agency Wales - North Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	Variable
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements North Shropshire District Council (now part of Shropshire Council) Denbighshire County Council - Planning Department Shropshire Council - Planning Department Wrexham County Borough Council - Planning Department Shropshire County Council (now part of Shropshire Council) Oswestry Borough Council (now part of Shropshire Council)	February 2009 February 2016 February 2016 February 2016 March 2009 October 2008	Not Applicable Variable Variable Variable Annual Rolling Update Not Applicable
Planning Hazardous Substance Consents North Shropshire District Council (now part of Shropshire Council) Denbighshire County Council - Planning Department Shropshire Council - Planning Department Wrexham County Borough Council - Planning Department Shropshire County Council (now part of Shropshire Council) Oswestry Borough Council (now part of Shropshire Council)	February 2009 February 2016 February 2016 February 2016 March 2009 October 2008	Not Applicable Variable Variable Variable Annual Rolling Update Not Applicable
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	October 2015	Annually
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2018	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	January 2019	Quarterly
Fuel Station Entries Catalist Ltd - Experian	November 2018	Quarterly
Gas Pipelines National Grid	July 2014	
Points of Interest - Commercial Services PointX	November 2018	Quarterly
Points of Interest - Education and Health PointX	November 2018	Quarterly
Points of Interest - Manufacturing and Production PointX	November 2018	Quarterly
Points of Interest - Public Infrastructure PointX	November 2018	Quarterly
Points of Interest - Recreational and Environmental PointX	November 2018	Quarterly
Underground Electrical Cables National Grid	December 2015	

Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural Resources Wales	August 2018	Bi-Annually
Areas of Adopted Green Belt Shropshire Council - Planning Department	August 2018	As notified
Areas of Unadopted Green Belt Shropshire Council - Planning Department	August 2018	As notified
Areas of Outstanding Natural Beauty Natural England Natural Resources Wales	August 2018 August 2018	Bi-Annually Bi-Annually
Environmentally Sensitive Areas Natural England The National Assembly for Wales - GI Services (Department of Planning & Countryside)	January 2017 January 2017	
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Denbighshire County Council Natural England Wrexham County Borough Council	August 2018 August 2018 August 2018	Bi-Annually Bi-Annually Bi-Annually
Marine Nature Reserves Natural Resources Wales	August 2018	Bi-Annually
National Nature Reserves Natural Resources Wales	August 2018	Bi-Annually
National Parks Natural England Natural Resources Wales	April 2017 August 2018	Bi-Annually Annually
Nitrate Vulnerable Zones Natural Resources Wales The National Assembly for Wales - GI Services (Department of Planning & Countryside)	July 2017 October 2005	Bi-Annually
Ramsar Sites Natural Resources Wales	February 2019	Bi-Annually
Sites of Special Scientific Interest Natural Resources Wales	February 2018	Bi-Annually
Special Areas of Conservation Natural Resources Wales	August 2018	Bi-Annually
Special Protection Areas Natural Resources Wales	August 2018	Bi-Annually
World Heritage Sites Historic England Welsh Historic Environment Service (Cadw)	July 2018 November 2017	Bi-Annually Bi-Annually

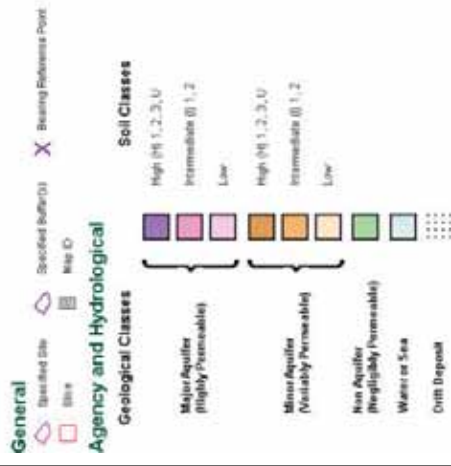
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

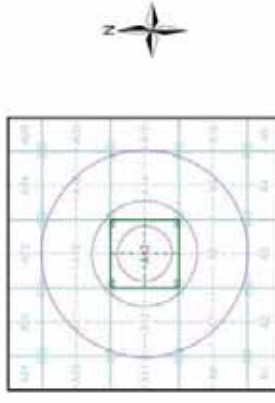
Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Natural Resources Wales Ty Cambria, 29 Newport Road, Cardiff, CF24 0TP	Telephone: 0300 065 3000 Email: enquiries@naturalresourceswales.gov.uk
3	Wrexham County Borough Council - Environmental Health Department Crown Buildings, P O Box 1297, Wrexham, Clwyd, LL13 8ZE	Telephone: 01978 297038 Fax: 01978 292502 Website: www.wrexham.gov.uk
4	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
5	Ordnance Survey Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	Wrexham County Borough Council Lampet Street, Guildhall, Wrexham, Clwyd, LL11 1WL	Telephone: 01978 292000 Fax: 01978 292502 Website: www.wrexham.gov.uk
7	The Coal Authority - Property Searches 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG	Telephone: 0345 762 6848 Fax: 01623 637 338 Email: groundstability@coal.gov.uk Website: www2.groundstability.com
8	PointX 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
9	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9966 Fax: 0844 844 9951 Email: helpdesk@landmark.co.uk Website: www.landmark.co.uk
10	Historic England 1 Waterhouse Square, 138 - 142 Holborn, London, EC1N 2ST	Telephone: 0370 333 0607 Email: customers@historicengland.org.uk Website: www.historicengland.org.uk
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

Groundwater Vulnerability



Site Sensitivity Context Map - Slice A

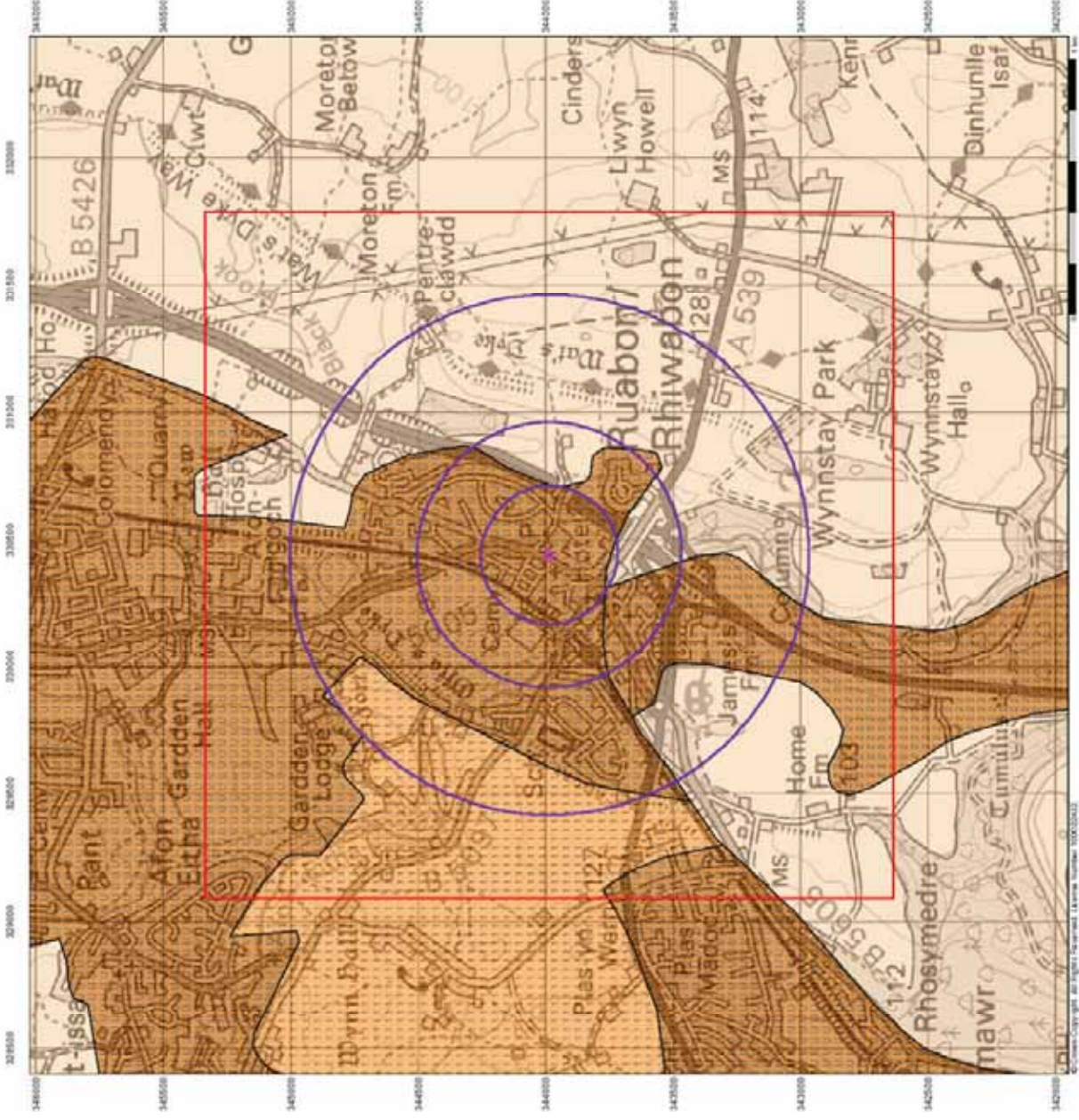


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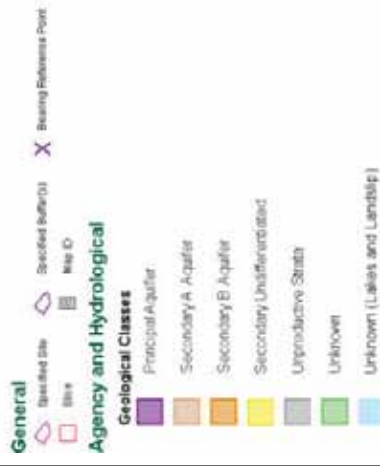
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Search Buffer (m): 1000

Site Details

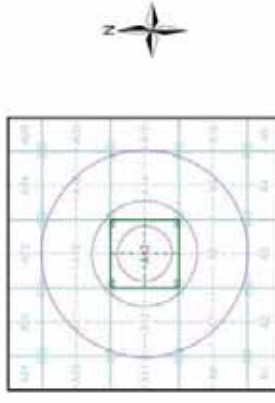
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Bedrock Aquifer Designation



Site Sensitivity Context Map - Slice A

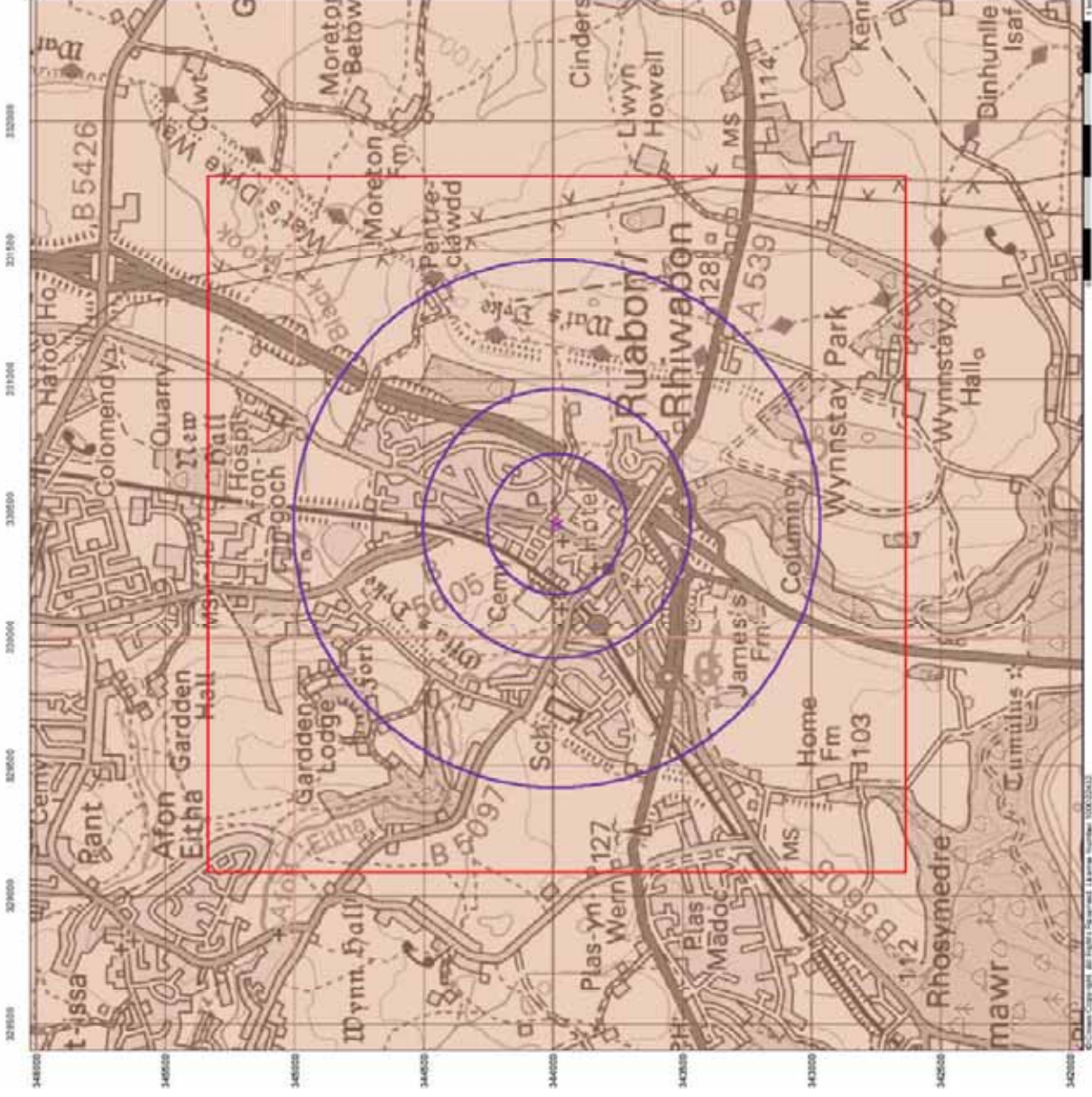


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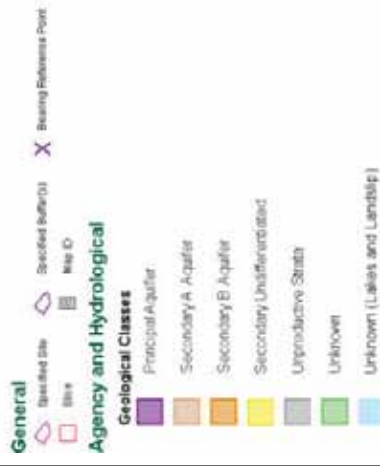
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 Search Buffer (m): 1000

Site Details

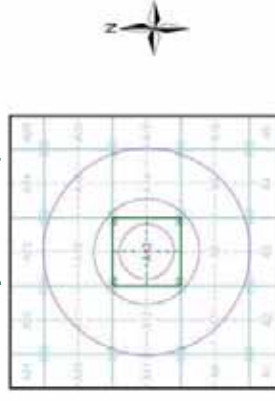
Buildings At, High Street, Ruabon, WREXHAM, LL14 6BL



Superficial Aquifer Designation



Site Sensitivity Context Map - Slice A

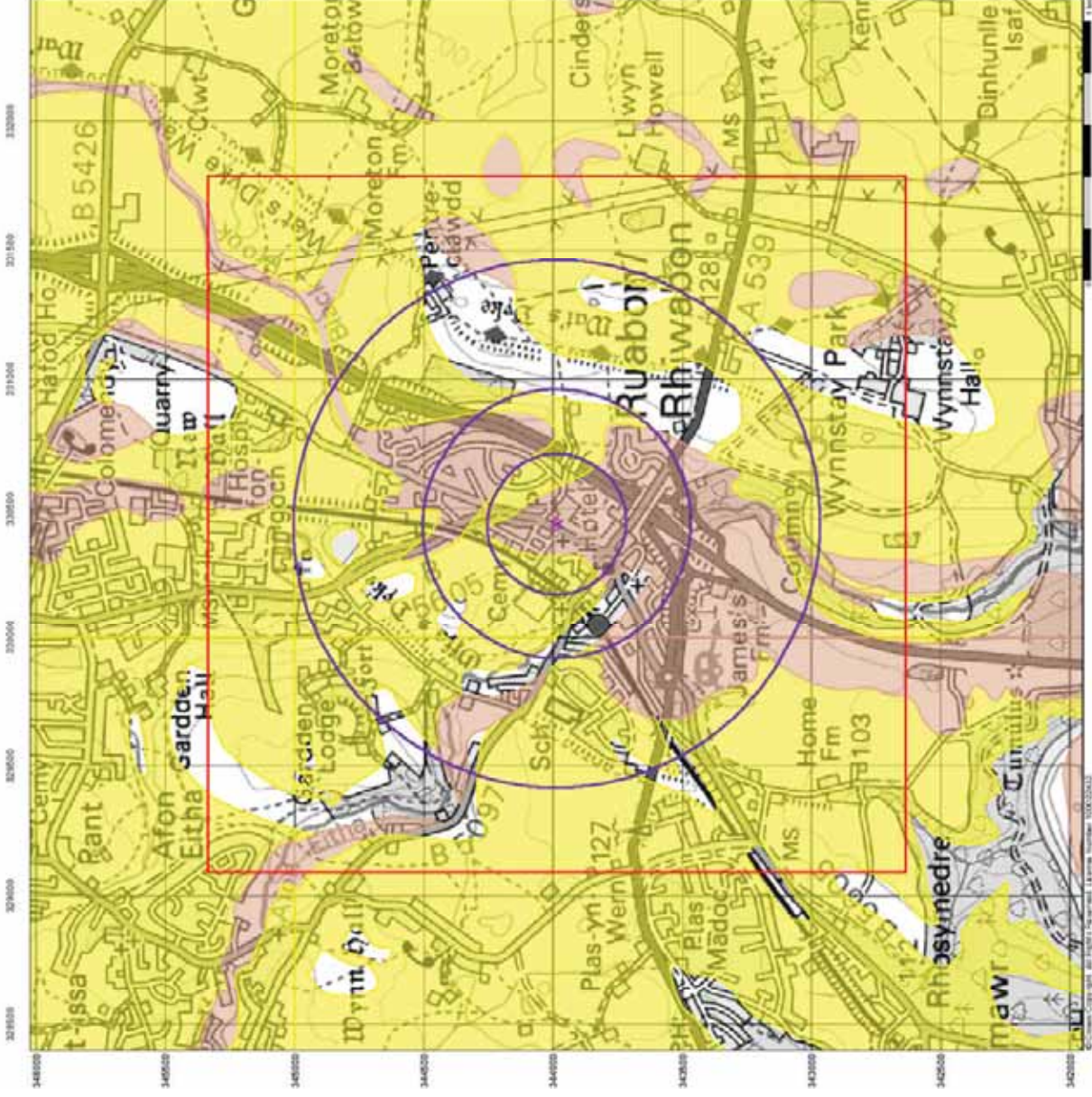


Order Details

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Site Area (Ha): 0.09
Search Buffer (m): 1000

Site Details

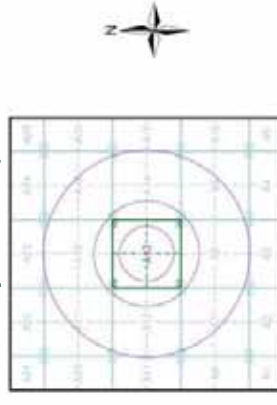
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Source Protection Zones



Site Sensitivity Context Map - Slice A



Order Details

Order Details

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National Grid Reference:	330440, 343990
Slice:	A
Site Area (Ha):	0.09
Search Buffer (m):	1000

Site Details

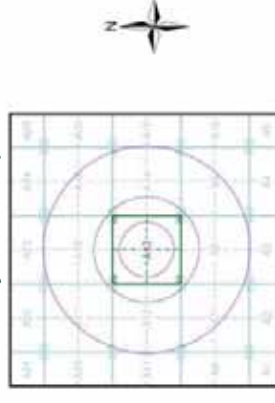
Site Details
Buildings At, High Street, Ruabon, WREXHAM, LL14 6BL

Sensitive Land Uses

General

- Sensitive Land Uses**
- | Symbol | Category |
|------------------------------------|-------------------------------------|
| Red square | Ancient Woodland |
| Green square with diagonal lines | Area of Adopted Green Belt |
| Green square with horizontal lines | Area of Unadopted Green Belt |
| Blue square with diagonal lines | Area of Outstanding Natural Beauty |
| Purple square | Environmentally Sensitive Area |
| Light blue square | Flood Plain |
| Orange square with diagonal lines | Local Nature Reserve |
| Pink square with diagonal lines | Marine Nature Reserve |
| Yellow square with diagonal lines | National Nature Reserve |
| Red square with diagonal lines | National Park |
| Green square with diagonal lines | Nature Sensitive Area |
| Green square with horizontal lines | Nature's Vulnerable Zone |
| Blue square with diagonal lines | Removal Site |
| Green square with vertical lines | Site of Special Scientific Interest |
| Purple square with diagonal lines | Special Area of Conservation |
| Green square with diagonal lines | Special Protection Area |
| Yellow square with diagonal lines | Wildfowl Sanctuary |

Site Sensitivity Context Map - Slice A



Order Details

Order Details

Order Number:	195243082_1_1
Customer Ref:	2187/sdl
National Grid Reference:	330440, 343990
Slice:	A
Site Area (Ha):	0.09
Search Buffer (m):	1000

Site Details

Site Details

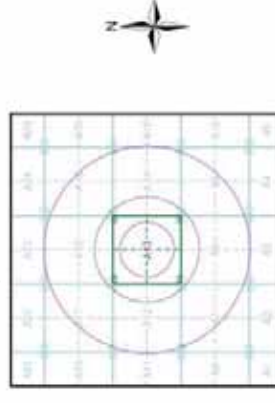
Buildings At, High Street, Ruabon, WREXHAM, LL14 6BL

BGS Flood GFS Data

General

- Agency and Hydrological (Flood)**
- | | | | | | |
|---|--------------|---|--|---|--|
|  | Special Site |  | Special (Buffer) Zone |  | Special Reference Point |
|  | Site |  | Unlimited Potential for Groundwater Flooding to Occur |  | Potential for Groundwater Flooding of Property Situated Below Ground Level |
|  | |  | Potential for Groundwater Flooding to Occur at Surface | | |

Site Sensitivity Context Map - Slice A



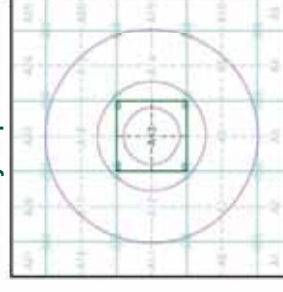
Order Details

Order Details

Order Number:	195243082_1_1
Customer Ref:	2187/sdl
National Grid Reference:	330440, 343990
Slice:	A
Site Area (Ha):	0.09
Search Buffer (m):	1000

Site Details

Site Details
Buildings At, High Street, Ruabon, WREXHAM, LL14 6BL



Order Details

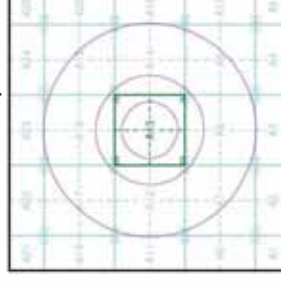
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Customer Ref:	2187/sdl
National Grid Reference:	330440, 343990
Slice:	A
Site Area (Ha):	0.09
Search Buffer (m):	1000

Site Details
Buildings At, High Street, Ruabon, WREXHAM, LL 14 6BL

Industrial Land Use Map

- General**
- Specified Site
 - Specified Buffer(s)
 - Map ID
 - Beaming Reference Point
- Industrial Land Use**
- Contemporary Trade Directory Entry
 - Fire Station Entry
 - One Neighbour
 - Points of Interest - Commercial Services
 - Points of Interest - Education and Health
 - Points of Interest - Manufacturing and Production
 - Points of Interest - Public Infrastructure
 - Points of Interest - Recreational and Environmental
 - Underground Electrical Cables

Industrial Land Use Map - Slice A

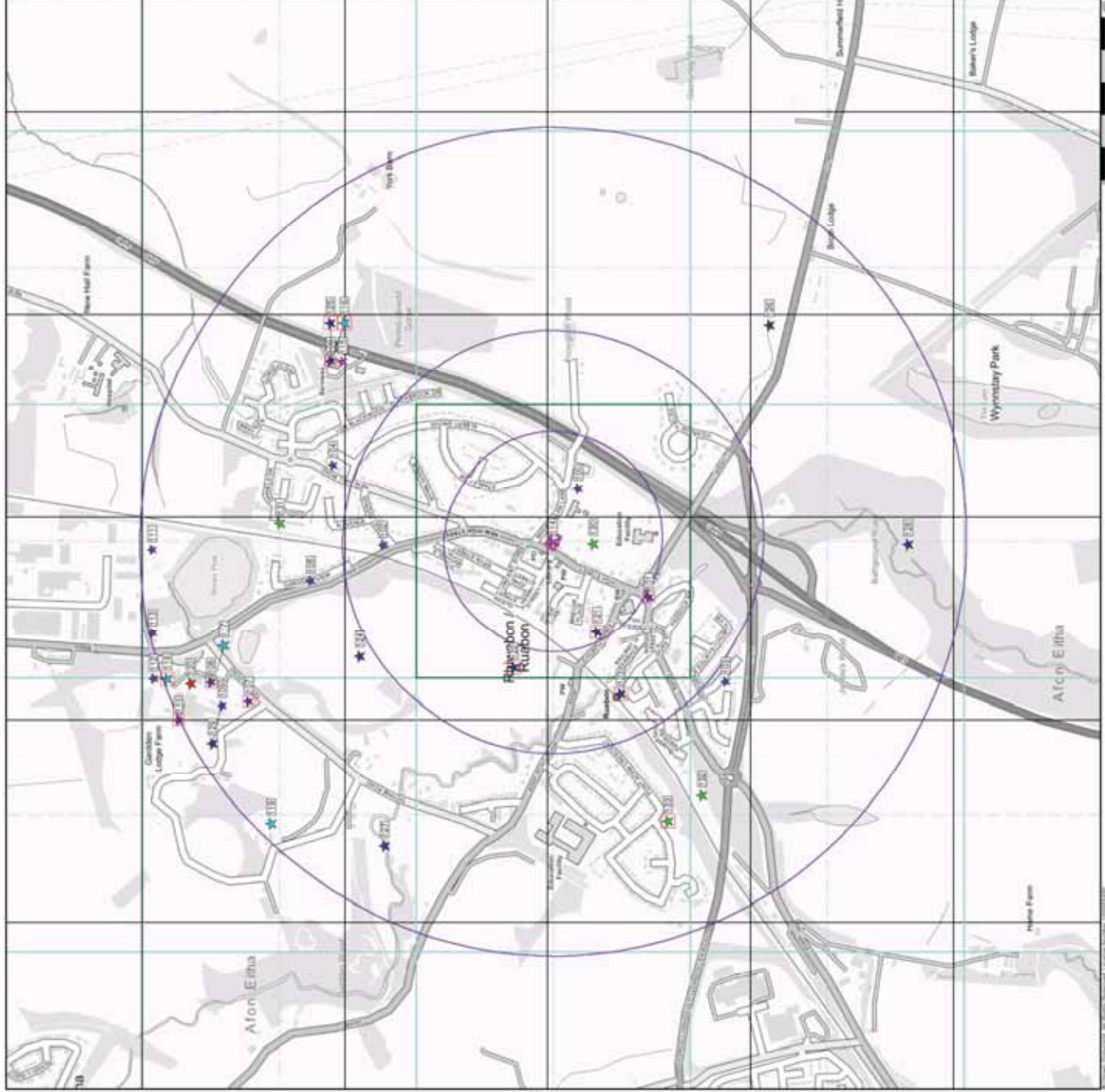


Order Details

Order Number: 195243082_1_1
 Customer Ref: 2187/sdi
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

Buildings At: High Street, Ruabon, WREXHAM, LL 14 6BL



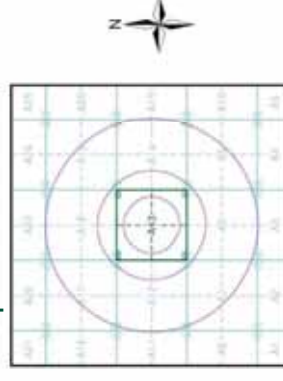
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



Order Details

Order Number: 195243082_1_1
 Customer Ref: 2187/sdl
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

Buildings A1, High Street, Ruabon, WREXHAM, LL 14 6BL

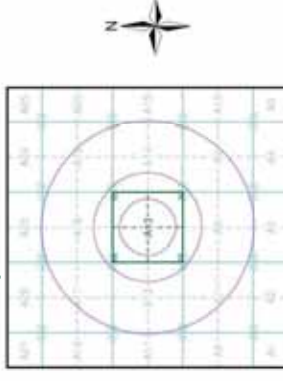


- General**
- Specified Site
 - Specified Buffer (1)
 - X Boundary Reference Point
 - Area ID
 - Boundary of Type at Location
- Agency and Hydrological (Boreholes)**
- B001 Borehole Depth 0 - 10m
 - B002 Borehole Depth 10 - 20m
 - B003 Borehole Depth 20m +
 - Contaminated
 - Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A

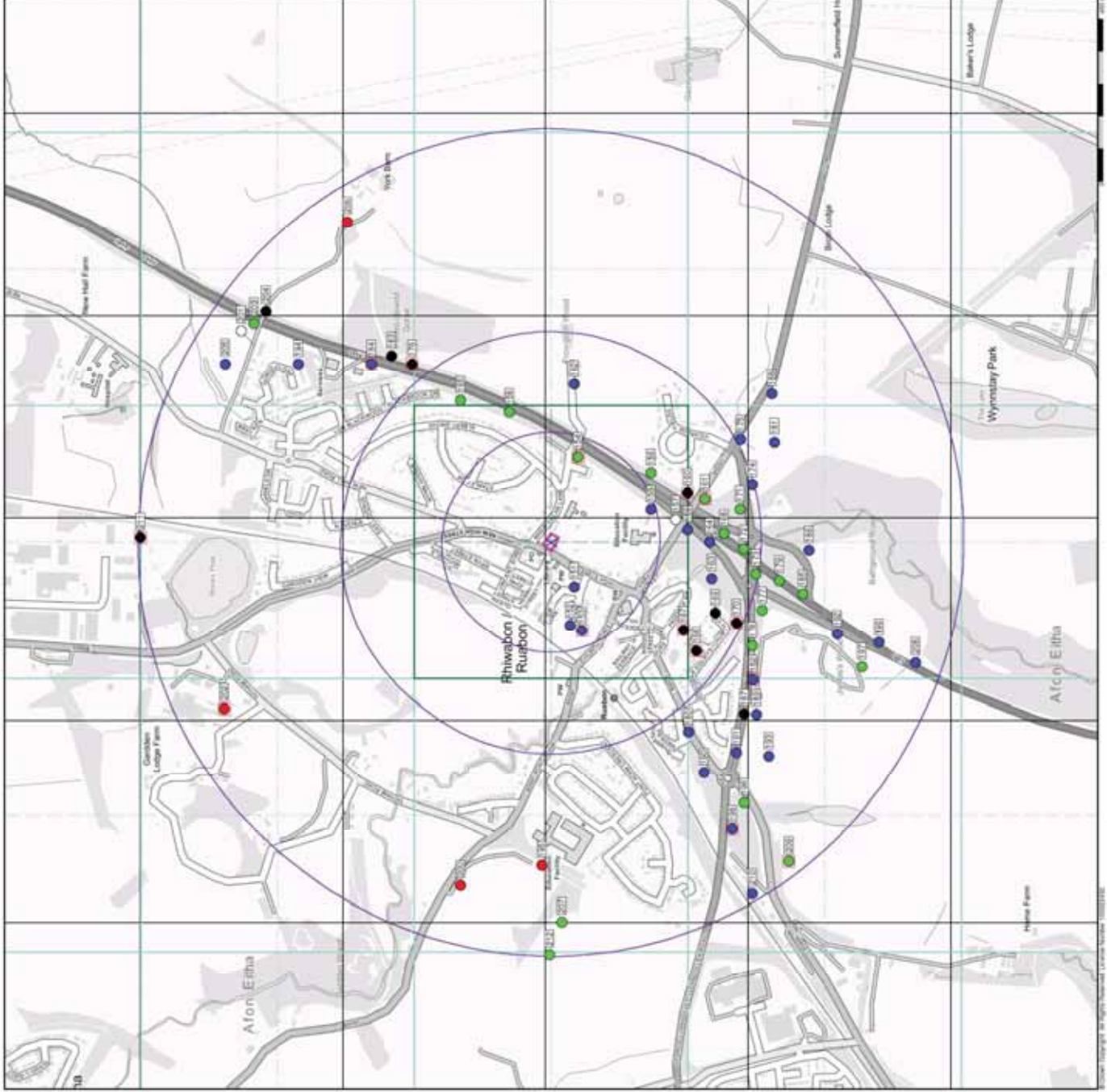


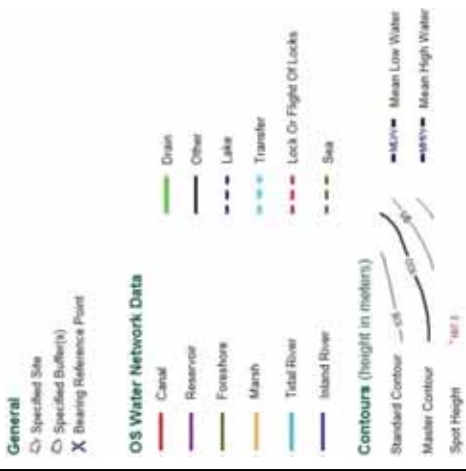
Order Details

Order Number: 195243082_1_1
 Customer Ref: 2187/sdl
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

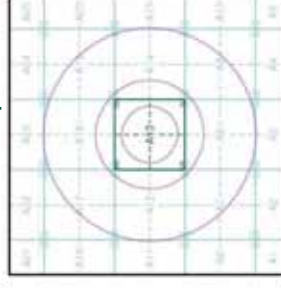
Site Details

Buildings At: High Street, Ruabon, WREXHAM, LL 14 6BL





OS Water Network Map - Slice A



Order Details

Order Number: 195243082_1_1
 Customer Ref: 2187/sdi
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

Buildings At: High Street, Ruabon, WREXHAM, LL 14 6BL

General
 ○ Specified Site
 X Search Reference Point

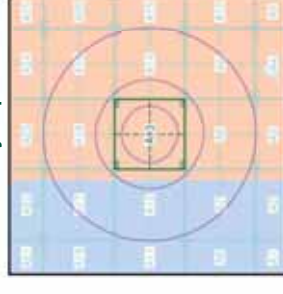
Risk of Flooding from Surface Water

High - 20 Year Return
 Medium - 100 Year Return
 Low - 1000 Year Return

Suitability

See this suitability map online
 National Grid Reference
 County to County
 Town to Town
 Street to Street
 Property

EANRW Suitability Map - Slice A



Order Details

Order Number: 195243082_1_1
 Customer Ref: 2187/sdi
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

Buildings At, High Street, Ruabon, WREXHAM, LL 14 6BL



General

☒ Specified Site

☐ Specified Submittal

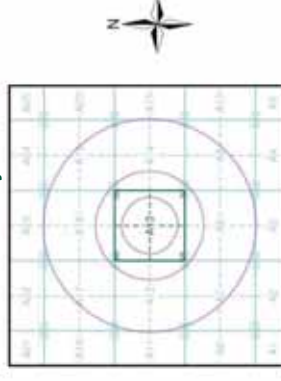
☒ Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg



Estimated Soil Chemistry Arsenic - Slice A



Order Details

Order Details: 195243082_1_1
 Customer Ref: 2187/sdl
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

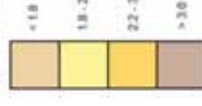
Buildings At: High Street, Ruabon, WREXHAM, LL 14 6BL

General

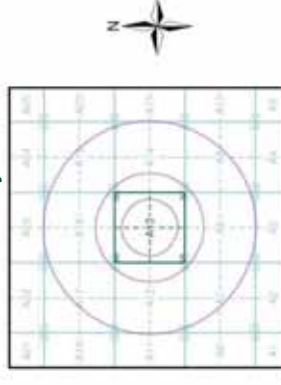
Specified Site ☒ Specimen Reference Point ☒ Bearing Reference Point ☒

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg



Estimated Soil Chemistry Cadmium - Slice A



Order Details

Order Details: 195243082_1_1
 Customer Ref: 2187/sdl
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

Buildings At, High Street, Ruabon, WREXHAM, LL 14 6BL

General

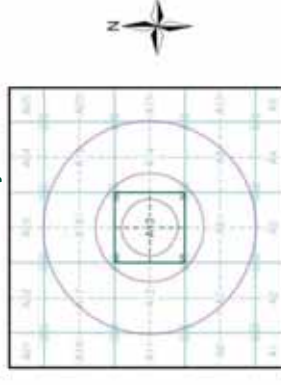
Specimen Site ☒ Specimen Buried ☐ Bearing Reference Point ☒

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg



Estimated Soil Chemistry Chromium - Slice A



Order Details

Order Details: 195243082_1_1
 Customer Ref: 2187/sdi
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

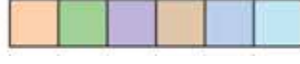
Buildings At: High Street, Ruabon, WREXHAM, LL 14 6BL

General

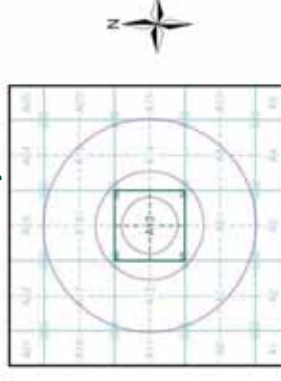
☒ Specified Site ☐ Specified Buffer (m)

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg



Estimated Soil Chemistry Lead - Slice A



Order Details

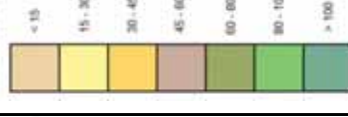
Order Details: 195243082_1_1
 Customer Ref: 2187/sdl
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

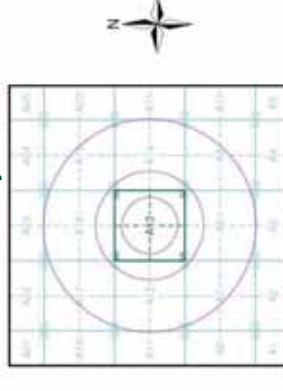
Buildings At: High Street, Ruabon, WREXHAM, LL 14 6BL

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg



Estimated Soil Chemistry Nickel - Slice A



Order Details

Order Details: 195243082_1_1
 Customer Ref: 2187/sdl
 National Grid Reference: 330440, 343990
 Slice: A
 Site Area (Ha): 0.09
 Search Buffer (m): 1000

Site Details

Buildings At: High Street, Ruabon, WREXHAM, LL 14 6BL

Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice

Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment

A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant

A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Client Details

Mr M Scott, GroundSolve Ltd, Unit 1, Well House Barns,
Chester Road, Bretton, Flintshire, CH4 0DH

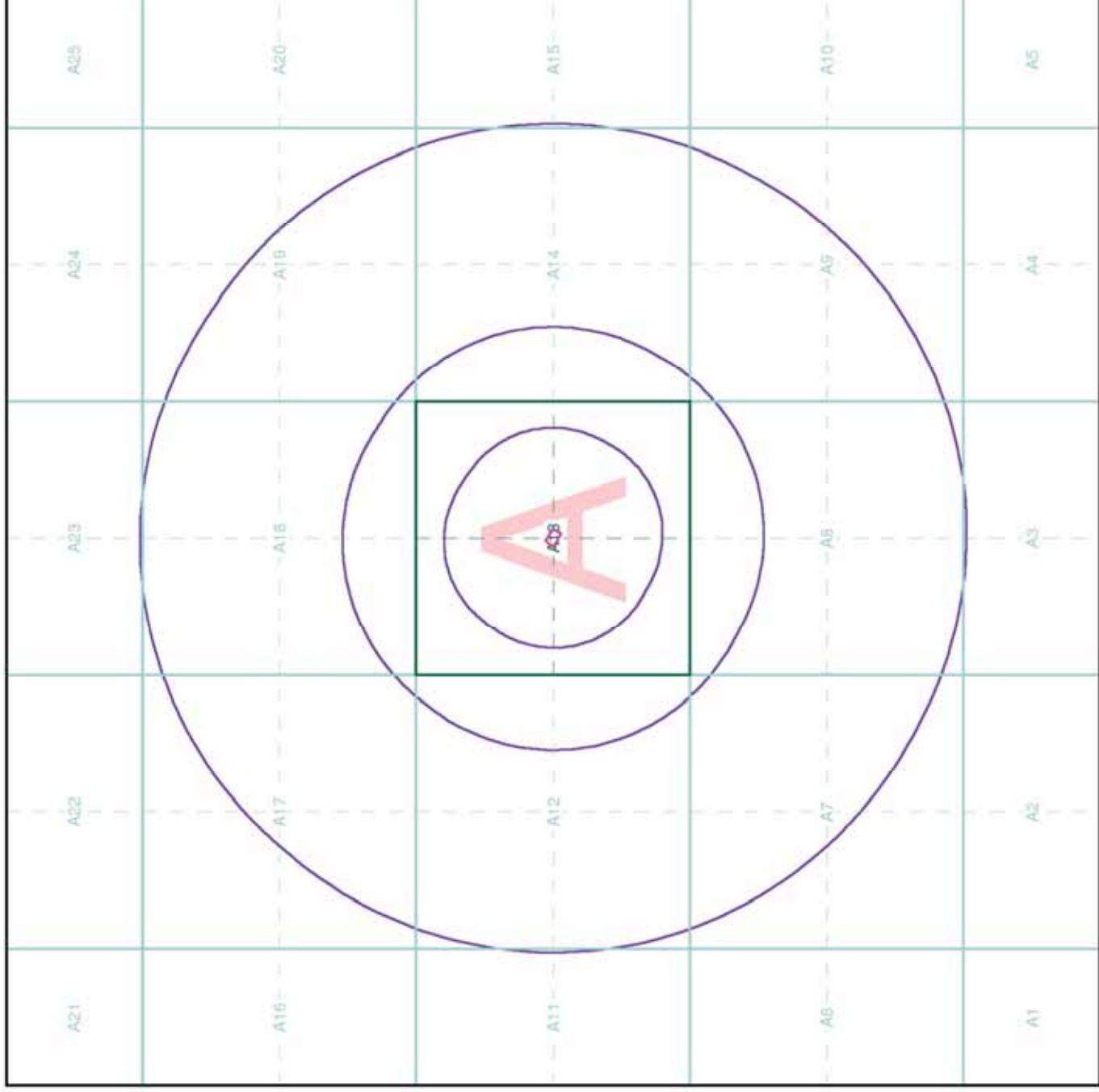
Order Details

Order Number: 195243082_1_1
Customer Ref: 2187/sdl
National Grid Reference: 330440, 343990
Site Area (Ha): 0.09
Search Buffer (m): 1000

Site Details

Buildings At, High Street, Ruabon, WREXHAM, LL 14 6BL

Full Terms and Conditions can be found on the following link:
<http://www.landmarkinfo.co.uk/Terms/Show/515>



APPENDIX D

Trial Pit Logs

TRIAL PIT TP1

Depth (m)	Strata
0.00-0.50	Grass and rubble over medium dense dark brown clayey gravelly SAND with frequent metal and plastic fragments. Gravel is fine to coarse, subangular to subrounded of sandstone and brick fragments. (MADE GROUND)
0.50-1.30	Medium dense brown very silty gravelly SAND. Gravel is fine to coarse subrounded sandstone. (POSSIBLE REWORKED GROUND)
1.30-1.90	Medium dense yellow brown and brown slightly silty SAND AND GRAVEL with low cobble content of sandstone. Gravel is fine to coarse, subrounded sandstone. (GLACIAL DEPOSITS)

Notes

1. Excavation terminated at 1.9m depth for soakaway testing,
2. Pit dimensions 1.6m x 0.6m,
3. Pit sides were stable,
4. No groundwater encountered.



TP1



TP1 – Spoil

TRIAL PIT TP2

Depth (m)	Strata
0.00-0.90	Grass and rubble over medium dense dark brown clayey gravelly SAND with Loose medium dense reddish brown gravelly SAND with frequent cobbles of brick and concrete, and frequent timber and plastic fragments. (MADE GROUND)
0.90-2.40	Medium dense yellow brown and brown silty SAND AND GRAVEL with low cobble content of sandstone. Gravel is fine to coarse, subrounded sandstone. (GLACIAL DEPOSITS)

Notes

1. Trial pit excavated alongside existing house foundation, which was encountered at 1.1m depth. The concrete thickness was 150mm, and projected out some 220mm from the brickwork (see following photograph).
2. Excavation terminated at 2.4m depth due to instability of trial pit in sand and gravel.
3. Pit dimensions 2.5m x 2.5m,
4. Pit sides were stable,
5. No groundwater encountered.
6. Jar samples taken at 0.3m and 1.5m depth. Tub sample taken at 1.0m depth.



TP2



TP2 – Spoil

TRIAL PIT TP3

Depth (m)	Strata
0.00-0.80	Grass over loose becoming medium dense reddish brown and grey gravelly SAND with frequent cobbles of brick and occasional plastic and timber fragments. (MADE GROUND)

Notes

1. Excavation initially terminated at 0.8m depth on metal obstruction – pit relocated 0.5m to west,
2. Metal tank with rectangular hole (some 1.0x2.0m) cut in top encountered at 0.8m depth, with the tank base at 2.2m depth. Tank was full of water with silty sand and gravel near base.
3. Pit dimensions 2.5m x 2.0m,
4. Pit sides were stable,
5. Strong water inflows when attempting to excavate alongside tank – assumed from water trapped by the tank,
6. Jar samples taken from 2.0m depth (inside tank).



TP3



TP3 – Spoil

TRIAL PIT TP4

Depth (m)	Strata
0.00-1.70	Grass over medium dense brown and grey brown slightly silty SAND AND GRAVEL with low cobble content of sandstone and rare cobbles of brick, concrete fragments, and rebar. (MADE GROUND) - 1.2m x 1.2m concrete block encountered at 1.2m depth (probable old pad foundation) - Concrete obstruction at 1.7m depth in southern end of pit, rebar obstruction at 1.0m depth in northern end of pit.

Notes

1. Excavation terminated at 1.7m depth due to obstructions,
2. Pit dimensions 2.0m x 0.6m,
3. Pit sides were unstable in sand and gravel strata,
4. No groundwater encountered,
5. Jar samples taken at 1.7m depth, tub sample taken at 1.2m depth.



TP4



TP4 – Spoil

TRIAL PIT TP5

Depth (m)	Strata
0.00-0.60	Grass over loose red brown sandy GRAVEL with frequent plastic, timber, metal and glass fragments. Gravel is fine to coarse, subangular sandstone. (MADE GROUND)
0.60-3.00	Medium dense yellow brown and brown silty SAND AND GRAVEL with low cobble content of sandstone. Gravel is fine to coarse, subrounded sandstone. (GLACIAL DEPOSITS)

Notes

1. Excavation terminated at 3.0m depth,
2. Boundary with made ground from tank excavations (dark grey SAND AND GRAVEL) visible in southern face of pit,
3. Pit dimensions 2.5m x 1.0m,
4. Pit sides becoming unstable with depth
5. No groundwater encountered.



TP5



TP5 - Spoil

TRIAL PIT A

Depth (m)	Strata
0.00 – 0.60	Medium dense brown clayey SAND and GRAVEL with occasional plastic, vegetation and timber elements. Gravel is fine sub-rounded and sub-angular sandstone (MADE GROUND)
0.60 – 0.80	Loose dark brown and red brown gravelly SAND with brick fragments. Gravel is fine sub-angular (MADE GROUND)
0.80 – 1.20	Firm grey becoming yellowish brown slightly sandy SILT (MADE GROUND)
1.20 – 2.10	Medium dense yellowish brown slightly silty SAND and GRAVEL with low sub-angular sandstone cobble content. Gravel is sub-angular fine to coarse sandstone (GLACIAL DEPOSIT)

Notes

1. Pit dimension 2.20 x 0.70 x 2.10m depth.
2. Pit sides were locally unstable.
3. No groundwater encountered.
4. Soakaway testing carried out.
5. Sample taken at 0.30m depth for chemical testing.
6. Sample taken at 1.00m depth for pH and Sulphate testing.



TP A – Pit walls



TP A – Arising

TRIAL PIT B

Depth (m)	Strata
0.00 – 0.30	Medium dense brown SAND and GRAVEL with occasional plastic, vegetation and timber elements. Gravel is fine sub-rounded and sub-angular sandstone (MADE GROUND)
0.30 – 0.35	Tarmac (MADE GROUND)
0.35 – 1.20	Firm brown SILT (MADE GROUND)
1.20 – 2.10	Medium dense yellowish brown very slightly silty SAND and GRAVEL with occasional cobble and sub-angular fine to coarse sandstone (GLACIAL DEPOSIT)

Notes

1. Pit dimension 2.30 x 0.70 x 2.10m depth.
2. Pit sides were locally unstable.
3. No groundwater encountered.
4. Soakaway testing carried out.
5. Sample taken at 0.20m depth for chemical testing.
6. Sample taken at 0.90m depth for pH and Sulphate testing.



TP B – Pit walls



TP B – Arising

TRIAL PIT C

Depth (m)	Strata
0.00 – 1.10	Medium dense brown and yellow very silty SAND and GRAVEL with occasional pockets of yellowish-brown silty sand, frequent brick fragments, occasional plastic and glass pieces. (MADE GROUND)
1.10 – 1.80	Medium dense yellowish brown very slightly silty SAND and GRAVEL with low sub-angular sandstone cobble content and occasional quartz. Gravel is sub-angular, sub-rounded and fine to coarse sandstone (GLACIAL DEPOSIT)

Notes

1. Pit dimension 2.50 x 0.70 x 1.80m depth.
2. Pit sides were unstable below 1.10m depth.
3. No groundwater encountered.
4. Sample taken at 1.10m depth for pH and Sulphate testing.





TP C – Arising

TRIAL PIT D

Depth (m)	Strata
0.00 – 0.90	Medium dense grey and yellowish-brown silty SAND and GRAVEL with high cobble content of brick, sandstone, concrete fragments and occasional plastic (MADE GROUND)
0.90 – 2.00	Medium dense yellowish brown slightly silty SAND and GRAVEL with high sandstone cobble content (GLACIAL DEPOSIT)

Notes

1. Pit dimension 2.50 x 1.00 x 2.00m depth.
2. Pit sides were unstable.
3. No groundwater encountered.
4. Sample taken at 0.50m depth for chemical testing.
5. Sample taken at 1.00m depth for pH and Sulphate testing.



TP D – Pit walls
GroundSolve Ltd



TP D – Arising

APPENDIX E

Soakaway Test Results & Calculations

The graph plots Head of water (metres) on the x-axis against Time (minutes) on the y-axis. The x-axis ranges from 0.00 to 0.80 with major grid lines every 0.20 units. The y-axis ranges from 0 to 100 with major grid lines every 10 units. A series of purple square data points are plotted, showing a decreasing trend. A black curve is fitted to these points. A red line is drawn from the x-axis at 0.20 metres up to the curve, and then horizontally to the y-axis at approximately 55 minutes.

Head of water (metres)	Time (minutes)
0.80	0
0.75	0
0.70	0
0.65	0
0.60	0
0.55	0
0.50	0
0.45	0
0.40	0
0.35	0
0.30	0
0.25	0
0.20	0
0.20	55

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.55	1.60	0.60	0.660	0.22	0.88	2.896	0.422	1.00	2	57	4.420E-05

* with gravel filter adjustment factor = 0.30, with no filter = 1.0

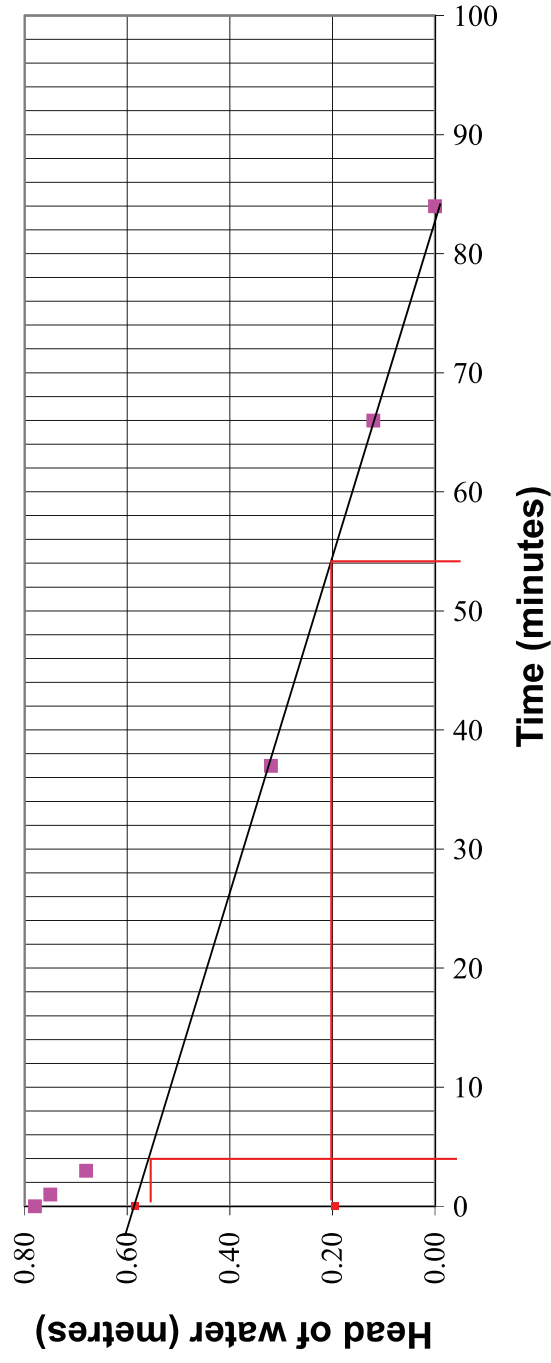
The graph plots Head of water (metres) on the x-axis (0.00 to 0.80) against Time (minutes) on the y-axis (0 to 100). A black line represents the theoretical relationship, and purple squares represent experimental data points. Red lines indicate specific head and time values.

Head of water (metres)	Time (minutes)
0.00	0
0.05	2
0.10	4
0.15	6
0.20	8
0.25	10
0.30	12
0.35	14
0.40	16
0.45	18
0.50	20
0.55	22
0.60	24
0.65	26
0.70	28
0.75	30
0.80	32

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.60	1.60	0.60	0.593	0.20	0.79	2.698	0.379	1.00	16	68	4.50E-05

* with gravel filter adjustment factor = 0.30, with no filter = 1.0

Former Victoria Garage, Ruabon
TP01 Test 2
09/11/2017

[illegible]

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.55	1.60	0.60	0.585	0.20	0.78	2.676	0.374	1.00	4	54	4.664E-05

* with gravel filter adjustment factor = 0.30, with no filter = 1.0

[illegible]

TPA Test 1

Head of water (metres)	Time (minutes)
0.80	0
0.65	5
0.55	18
0.35	30
0.20	48
0.10	58

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
2.10	2.20	0.70	0.593	0.20	0.79	3.831	0.608	1.00	10	47	7.152E-05

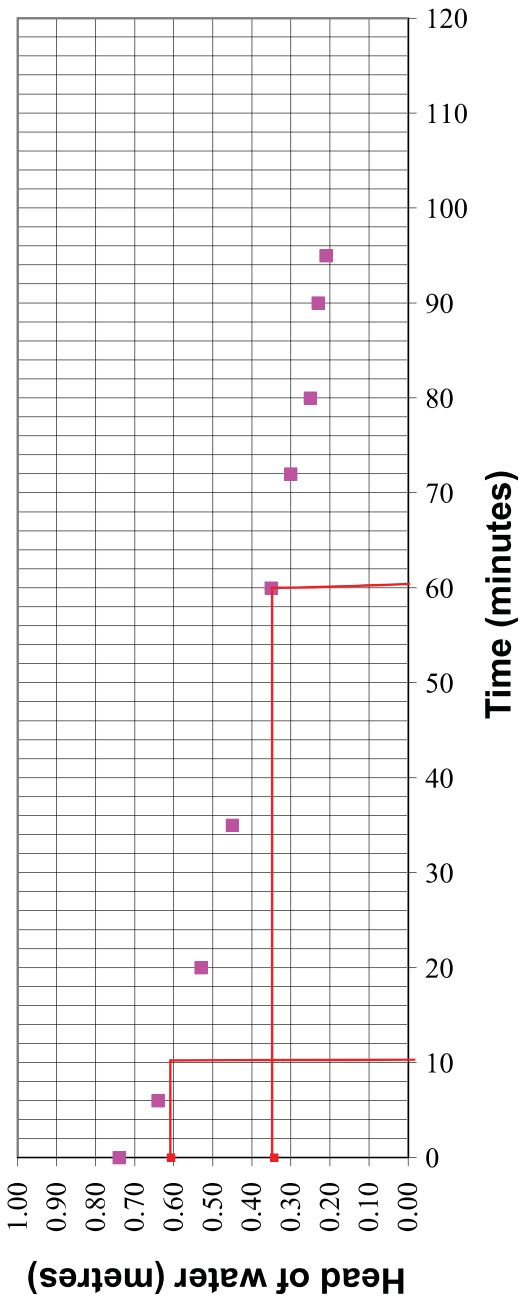
* with gravel filter adjustment factor = 0.30, with no filter = 1.0

GroundSolve Ltd

2187 Former Victoria Garage, Ruabon

TPA Test 2

12/03/19

[illegible]

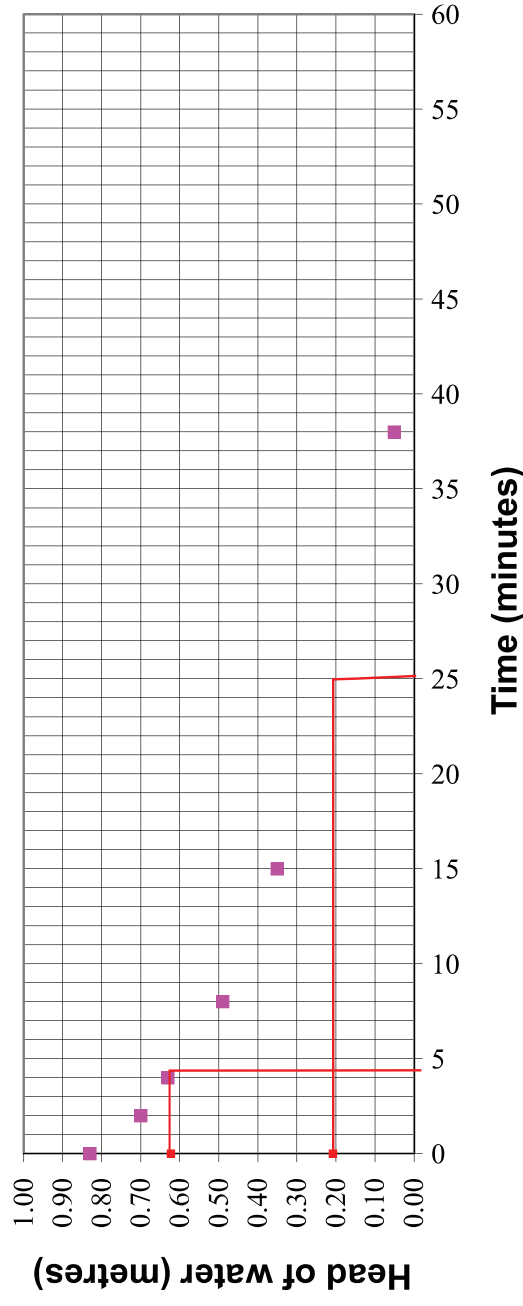
Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
2.10	2.20	0.70	0.555	0.19	0.74	3.686	0.570	1.00	10	60	5.153E-05

* with gravel filter adjustment factor = 0.30, with no filter = 1.0

2187 Former Victoria Garage, Ruabon

TPB Test 1

12/03/19

[illegible]

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.95	2.30	0.70	0.623	0.21	0.83	4.100	0.668	1.00	4	25	1.293E-04

* with gravel filter adjustment factor = 0.30, with no filter = 1.0

Note: pit silted up to 1.95m depth during test (original depth was 2.1m)

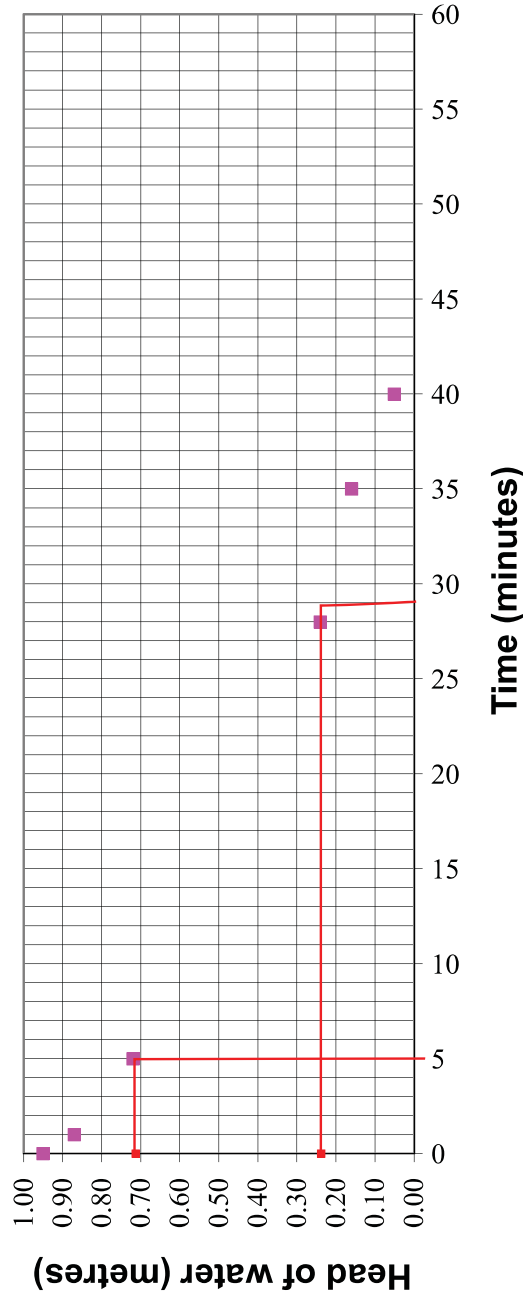
TPB Test 2

The figure is a dual-axis plot. The left y-axis is labeled 'Head of water (metres)' and ranges from 0.00 to 1.00 in increments of 0.10. The right y-axis is labeled 'Time (minutes)' and ranges from 0 to 60 in increments of 5. The x-axis is labeled 'Time (minutes)' and ranges from 0 to 60 in increments of 5. A red step function line represents the head of water over time. The line starts at 0.00 metres at 0 minutes, rises to 0.60 metres at 5 minutes, stays at 0.60 metres until 25 minutes, rises to 0.20 metres at 25 minutes, stays at 0.20 metres until 35 minutes, and then rises to 0.10 metres at 35 minutes. Purple square markers are plotted at the following coordinates (Time, Head): (0, 0.00), (2, 0.00), (4, 0.00), (6, 0.80), (14, 0.50), (25, 0.20), and (35, 0.10).

Time (minutes)	Head of water (metres)
0	0.00
2	0.00
4	0.00
6	0.80
14	0.50
25	0.20
35	0.10

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.95	2.30	0.70	0.638	0.21	0.85	4.160	0.684	1.00	8	28	1.371E-04

Note: Occasional minor collapses of pit walls occurred during test cycle

[illegible]

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.95	2.30	0.70	0.713	0.24	0.95	4.460	0.765	1.00	5	29	1.191E-04

Note: Occasional minor collapses of pit walls occurred during test cycle

APPENDIX F

Chemical Test Results



Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Ground Solve
Unit 1
Well House Barns
Chester Road
Bretton
Cheshire
CH4 0DH

Attention: Stefan Imiolczyk

CERTIFICATE OF ANALYSIS

Date: 21 November 2017
Customer: H_GRSOLVE_BRE
Sample Delivery Group (SDG): 171111-58
Your Reference: 2024/VGR/labtest/SDI
Location: Victoria Garage, Ruabon
Report No: 433504

We received 6 samples on Friday November 10, 2017 and 6 of these samples were scheduled for analysis which was completed on Tuesday November 21, 2017. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 171111-58 **Client Reference:** 2024/VGR/labtest/SDI **Report Number:** 433504
Location: Victoria Garage, Ruabon **Order Number:** 2024/VGR/labtest/SDI **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16540675	TP2		0.30 - 0.30	09/11/2017
16540677	TP2		1.00 - 1.00	09/11/2017
16540676	TP2		1.50 - 1.50	09/11/2017
16540678	TP3		2.00 - 2.00	09/11/2017
16540680	TP4		1.20 - 1.20	
16540679	TP4		1.70 - 1.70	

Maximum Sample/Coolbox Temperature (°C) :

10.4

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 171111-58 Client Reference: 2024/VGR/labtest/SDI Report Number: 433504
Location: Victoria Garage, Ruabon Order Number: 2024/VGR/labtest/SDI Superseded Report:

Results Legend	Lab Sample No(s)		16540675	16540677	16540676	16540678	16540680	16540679
	Customer Sample Reference		TP2	TP2	TP2	TP3	TP4	TP4
	AGS Reference							
	Depth (m)		0.30 - 0.30	1.00 - 1.00	1.50 - 1.50	2.00 - 2.00	1.20 - 1.20	1.70 - 1.70
	Container		250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)
	Sample Type		S	S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 4	X	X	X		X	
Chromium III	All	NDPs: 0 Tests: 4	X	X	X		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4	X	X	X		X	
Easily Liberated Sulphide	All	NDPs: 0 Tests: 4	X	X	X		X	
Elemental Sulphur	All	NDPs: 0 Tests: 4	X	X	X		X	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 4	X	X	X		X	
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 4	X	X	X		X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4		X	X	X		X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4	X	X	X		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 4	X	X	X		X	
PAH by GC/MS	All	NDPs: 0 Tests: 4	X	X	X		X	
pH	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 4	X	X	X		X	
Sample description	All	NDPs: 0 Tests: 6	X	X	X	X	X	X



CERTIFICATE OF ANALYSIS

SDG: 171111-58 Client Reference: 2024/VGR/labtest/SDI Report Number: 433504
Location: Victoria Garage, Ruabon Order Number: 2024/VGR/labtest/SDI Superseded Report:

Results Legend



Test

No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer
Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

Total Organic Carbon

All

NDPs: 0
Tests: 4

X

X

X

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 4

X

X

X

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 171111-58 **Client Reference:** 2024/VGR/labtest/SDI **Report Number:** 433504
Location: Victoria Garage, Ruabon **Order Number:** 2024/VGR/labtest/SDI **Superseded Report:**

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
16540675	TP2	0.30 - 0.30	Dark Brown	Sandy Loam	Stones	Crushed Brick
16540676	TP2	1.50 - 1.50	Dark Brown	Sand	Stones	None
16540677	TP2	1.00 - 1.00	Dark Brown	Loamy Sand	Stones	Crushed Brick
16540678	TP3	2.00 - 2.00	Dark Brown	Sandy Loam	Stones	Crushed Brick
16540679	TP4	1.70 - 1.70	Dark Brown	Loamy Sand	Stones	Crushed Brick
16540680	TP4	1.20 - 1.20	Dark Brown	Loamy Sand	Stones	Crushed Brick

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 171111-58 Client Reference: 2024/VGR/labtest/SDI Report Number: 433504
Location: Victoria Garage, Ruabon Order Number: 2024/VGR/labtest/SDI Superseded Report:

TPH CWG (S)

Results Legend			Customer Sample Ref.		TP2	TP2	TP3	TP4		
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.30 - 0.30 Soil/Solid (S) 09/11/2017 10/11/2017 171111-58 16540675	1.50 - 1.50 Soil/Solid (S) 09/11/2017 10/11/2017 171111-58 16540676	2.00 - 2.00 Soil/Solid (S) 09/11/2017 10/11/2017 171111-58 16540678	1.70 - 1.70 Soil/Solid (S) 09/11/2017 10/11/2017 171111-58 16540679			
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
dis.filt	Dissolved / filtered sample.									
tot.unfilt	Total / unfiltered sample.									
*	Subcontracted test.									
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery									
(F)	Trigger breach confirmed									
1-5&+9@	Sample deviation (see appendix)									
Component	LOD/Units	Method								
GRO Surrogate % recovery**	%	TM089		85	116	60	86			
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089		102	<44	<44	<44			
				M	M	M	\$ M			
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5	<5	<5	<5			
				#	#	#	\$ #			
Benzene	<10 µg/kg	TM089		<10	<10	<10	<10			
				M	M	M	\$ M			
Toluene	<2 µg/kg	TM089		3.72	2.19	<2	2.22			
				M	M	M	\$ M			
Ethylbenzene	<3 µg/kg	TM089		<3	<3	<3	<3			
				M	M	M	\$ M			
m,p-Xylene	<6 µg/kg	TM089		<6	<6	<6	<6			
				M	M	M	\$ M			
o-Xylene	<3 µg/kg	TM089		<3	<3	<3	<3			
				M	M	M	\$ M			
sum of detected mpo xylene by GC	<9 µg/kg	TM089		<9	<9	<9	<9			
							\$			
sum of detected BTEX by GC	<24 µg/kg	TM089		<24	<24	<24	<24			
							\$			
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10	<10	<10			
							\$			
Aliphatics >C6-C8	<10 µg/kg	TM089		26	<10	<10	<10			
							\$			
Aliphatics >C8-C10	<10 µg/kg	TM089		21.1	<10	<10	<10			
							\$			
Aliphatics >C10-C12	<10 µg/kg	TM089		13.6	<10	<10	<10			
							\$			
Aliphatics >C12-C16	<100 µg/kg	TM173		967	<100	<100	776			
							\$			
Aliphatics >C16-C21	<100 µg/kg	TM173		4780	<100	306	3660			
							\$			
Aliphatics >C21-C35	<100 µg/kg	TM173		93900	1430	9710	38000			
							\$			
Aliphatics >C35-C44	<100 µg/kg	TM173		47900	<100	5050	19900			
							\$			
Total Aliphatics >C12-C44	<100 µg/kg	TM173		148000	1430	15100	62300			
							\$			
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10	<10			
							\$			
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10	<10			
							\$			
Aromatics >EC8-EC10	<10 µg/kg	TM089		18.6	<10	<10	<10			
							\$			
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10	<10	<10	<10			
							\$			
Aromatics >EC12-EC16	<100 µg/kg	TM173		2070	2700	1910	3400			
							\$			
Aromatics >EC16-EC21	<100 µg/kg	TM173		17000	35400	39200	52700			
							\$			
Aromatics >EC21-EC35	<100 µg/kg	TM173		131000	71100	74500	160000			
							\$			
Aromatics >EC35-EC44	<100 µg/kg	TM173		109000	17800	23200	70400			
							\$			
Aromatics >EC40-EC44	<100 µg/kg	TM173		46500	6360	9250	29100			
							\$			
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		259000	127000	139000	286000			
							\$			
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		407000	128000	154000	348000			
							\$			



CERTIFICATE OF ANALYSIS

Validated

SDG: 171111-58 Client Reference: 2024/VGR/labtest/SDI Report Number: 433504
Location: Victoria Garage, Ruabon Order Number: 2024/VGR/labtest/SDI Superseded Report:

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP2 0.30 - 0.30 SOLID 09/11/2017 00:00:00 12/11/2017 12:12:38 171111-58 16540675 TM048	20/11/2017	Eva Guerra	n	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP2 1.50 - 1.50 SOLID 09/11/2017 00:00:00 12/11/2017 13:00:06 171111-58 16540676 TM048	20/11/2017	Eva Guerra	n	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP3 2.00 - 2.00 SOLID 09/11/2017 00:00:00 12/11/2017 13:09:43 171111-58 16540678 TM048	20/11/2017	Eva Guerra	n	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP4 1.70 - 1.70 SOLID 12/11/2017 12:50:05 171111-58 16540679 TM048	20/11/2017	Eva Guerra	n	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 171111-58 **Client Reference:** 2024/VGR/labtest/SDI **Report Number:** 433504
Location: Victoria Garage, Ruabon **Order Number:** 2024/VGR/labtest/SDI **Superseded Report:**

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
ASB_PREP				
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM136	Method 17.10, Second Site property, March 2003	Determination of Sulphur by HPLC		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished) ¹	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM218	Determination of PAH by GCMS Microwave extraction	The determination of PAH in soil samples by microwave extraction and GC-MS		
TM243		Mixed Anions In Soils By Kone		

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG:	171111-58	Client Reference:	2024/VGR/labtest/SDI	Report Number:	433504
Location:	Victoria Garage, Ruabon	Order Number:	2024/VGR/labtest/SDI	Superseded Report:	

Test Completion Dates

Lab Sample No(s)	16540675	16540676	16540677	16540678	16540679	16540680
Customer Sample Ref.	TP2	TP2	TP2	TP3	TP4	TP4
AGS Ref.						
Depth	0.30 - 0.30	1.50 - 1.50	1.00 - 1.00	2.00 - 2.00	1.70 - 1.70	1.20 - 1.20
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	21-Nov-2017	20-Nov-2017	21-Nov-2017	20-Nov-2017	20-Nov-2017	21-Nov-2017
Asbestos ID in Solid Samples	20-Nov-2017	20-Nov-2017		20-Nov-2017	20-Nov-2017	
Chromium III	21-Nov-2017	20-Nov-2017		21-Nov-2017	21-Nov-2017	
Cyanide Comp/Free/Total/Thiocyanate	20-Nov-2017	20-Nov-2017		20-Nov-2017	20-Nov-2017	
Easily Liberated Sulphide	17-Nov-2017	17-Nov-2017		17-Nov-2017	17-Nov-2017	
Elemental Sulphur	21-Nov-2017	21-Nov-2017		21-Nov-2017	21-Nov-2017	
EPH CWG (Aliphatic) GC (S)	16-Nov-2017	17-Nov-2017		17-Nov-2017	17-Nov-2017	
EPH CWG (Aromatic) GC (S)	16-Nov-2017	17-Nov-2017		17-Nov-2017	17-Nov-2017	
GRO by GC-FID (S)	20-Nov-2017	20-Nov-2017		20-Nov-2017	20-Nov-2017	
Hexavalent Chromium (s)	21-Nov-2017	20-Nov-2017		20-Nov-2017	20-Nov-2017	
Metals in solid samples by OES	21-Nov-2017	20-Nov-2017		21-Nov-2017	21-Nov-2017	
PAH by GCMS	21-Nov-2017	21-Nov-2017		21-Nov-2017	21-Nov-2017	
pH	16-Nov-2017	16-Nov-2017	16-Nov-2017	16-Nov-2017	16-Nov-2017	16-Nov-2017
Phenols by HPLC (S)	20-Nov-2017	20-Nov-2017		20-Nov-2017	20-Nov-2017	
Sample description	12-Nov-2017	12-Nov-2017	12-Nov-2017	12-Nov-2017	12-Nov-2017	12-Nov-2017
Total Organic Carbon	19-Nov-2017	19-Nov-2017		19-Nov-2017	19-Nov-2017	
TPH CWG GC (S)	20-Nov-2017	20-Nov-2017		20-Nov-2017	20-Nov-2017	



CERTIFICATE OF ANALYSIS

SDG:	171111-58	Client Reference:	2024/VGR/labtest/SDI	Report Number:	433504
Location:	Victoria Garage, Ruabon	Order Number:	2024/VGR/labtest/SDI	Superseded Report:	

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

General

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before preservation was performed
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Deeside
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Ground Solve
Unit 1
Well House Barns
Chester Road
Bretton
Cheshire
CH4 0DH

Attention: Stefan Imiolczyk

CERTIFICATE OF ANALYSIS

Date of report Generation: 04 March 2019
Customer: H_GRSOLVE_BRE
Sample Delivery Group (SDG): 190218-49
Your Reference: 2187/SDI
Location: Victoria Garage, Ruabon
Report No: 495233

This report has been revised and directly supersedes 495216 in its entirety.

We received 6 samples on Monday February 18, 2019 and 6 of these samples were scheduled for analysis which was completed on Monday March 04, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG:	190218-49	Client Reference:	2187/SDI	Report Number:	495233
Location:	Victoria Garage, Ruabon	Order Number:	2187/SDI	Superseded Report:	495216

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19380595	Base A			
19380596	Base B			
19380597	Wall C			
19380598	Wall D			
19380599	Wall E			
19380600	Wall F			

Maximum Sample/Coolbox Temperature (°C) :

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

6.6

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 190218-49

Client Reference: 2187/SDI

Report Number: 495233

Location:

Victoria Garage, Ruabon

Order Number: 2187/SDI

Superseded Report: 495216

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
 UNS - Unspecified Solid
 GW - Ground Water
 SW - Surface Water
 LE - Land Leachate
 PL - Prepared Leachate
 PR - Process Water
 SA - Saline Water
 TE - Trade Effluent
 TS - Treated Sewage
 US - Untreated Sewage
 RE - Recreational Water
 DW - Drinking Water
 Non-regulatory
 UNL - Unspecified Liquid
 SL - Sludge
 G - Gas
 OTH - Other

Lab Sample No(s)

Customer Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

			19380595	19380596	19380597	19380598	19380599	19380600
			Base A	Base B	Wall C	Wall D	Wall E	Wall F
			250g Amber Jar (ALE210)	250g Amber Jar (ALE215)	250g Amber Jar (ALE210)	250g Amber Jar (ALE215)	250g Amber Jar (ALE210)	250g Amber Jar (ALE215)
			S	S	S	S	S	S
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6		X	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
PAH by GCMS	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 6	X	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190218-49

Client Reference: 2187/SDI

Report Number: 495233

Location: Victoria Garage, Ruabon

Order Number: 2187/SDI

Superseded Report: 495216

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
19380595	Base A		Dark Brown	N/A	Stones	Crushed Brick
19380596	Base B		Dark Brown	N/A	Stones	Crushed Brick
19380597	Wall C		Dark Brown	Sandy Loam	Stones	Crushed Brick
19380598	Wall D		Light Brown	Sandy Loam	Stones	Brick
19380599	Wall E		Light Brown	Loamy Sand	Stones	Brick
19380600	Wall F		Light Brown	Sandy Loam	Stones	Crushed Brick

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 190218-49

Client Reference: 2187/SDI

Report Number: 495233

Location: Victoria Garage, Ruabon

Order Number: 2187/SDI

Superseded Report: 495216

Table of Results - Appendix

Method No	Reference	Description
ASB_PREP		
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



CERTIFICATE OF ANALYSIS

Validated

SDG: 190218-49

Client Reference: 2187/SDI

Report Number: 495233

Location: Victoria Garage, Ruabon

Order Number: 2187/SDI

Superseded Report: 495216

Test Completion Dates

Lab Sample No(s)
Customer Sample Ref.

AGS Ref.
Depth
Type

	19380595	19380596	19380597	19380598	19380599	19380600
	Base A	Base B	Wall C	Wall D	Wall E	Wall F
	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
EPH CWG (Aliphatic) GC (S)	26-Feb-2019	26-Feb-2019	26-Feb-2019	27-Feb-2019	26-Feb-2019	27-Feb-2019
EPH CWG (Aromatic) GC (S)	26-Feb-2019	26-Feb-2019	26-Feb-2019	27-Feb-2019	26-Feb-2019	27-Feb-2019
GRO by GC-FID (S)	25-Feb-2019	25-Feb-2019	26-Feb-2019	26-Feb-2019	25-Feb-2019	25-Feb-2019
Metals in solid samples by OES	23-Feb-2019	25-Feb-2019	25-Feb-2019	25-Feb-2019	25-Feb-2019	25-Feb-2019
PAH by GCMS	26-Feb-2019	26-Feb-2019	27-Feb-2019	26-Feb-2019	26-Feb-2019	04-Mar-2019
Sample description	19-Feb-2019	19-Feb-2019	19-Feb-2019	19-Feb-2019	19-Feb-2019	19-Feb-2019
TPH CWG GC (S)	27-Feb-2019	27-Feb-2019	26-Feb-2019	27-Feb-2019	26-Feb-2019	27-Feb-2019
VOC MS (S)	25-Feb-2019	25-Feb-2019	25-Feb-2019	25-Feb-2019	25-Feb-2019	25-Feb-2019



CERTIFICATE OF ANALYSIS

SDG:	190218-49	Client Reference:	2187/SDI	Report Number:	495233
Location:	Victoria Garage, Ruabon	Order Number:	2187/SDI	Superseded Report:	495216

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

General

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Anatole	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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Website: www.alsenvironmental.co.uk

Ground Solve
Unit 1
Well House Barns
Chester Road
Bretton
Cheshire
CH4 0DH

Attention: Stefan Imiolczyk

CERTIFICATE OF ANALYSIS

Date of report Generation: 23 March 2019
Customer: H_GRSOLVE_BRE
Sample Delivery Group (SDG): 190313-106
Your Reference: 2187/SDI
Location: Victoria Garage, Ruabon
Report No: 498071

We received 7 samples on Wednesday March 13, 2019 and 7 of these samples were scheduled for analysis which was completed on Saturday March 23, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 190313-106 **Client Reference:** 2187/SDI **Report Number:** 498071
Location: Victoria Garage, Ruabon **Order Number:** 2187/SDI **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19539513	TPA		0.30	12/03/2019
19539514	TPA		1.00	12/03/2019
19539515	TPB		0.20	12/03/2019
19539516	TPB		0.90	12/03/2019
19539517	TPC		1.10	12/03/2019
19539518	TPD		0.50	12/03/2019
19539519	TPD		1.00	12/03/2019

Maximum Sample/Coolbox Temperature (°C) :

12.2

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 190313-106 Client Reference: 2187/SDI Report Number: 498071
Location: Victoria Garage, Ruabon Order Number: 2187/SDI Superseded Report:

Results Legend			Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other			19639513	19639514	19639515	19639516	19639517	19639518	19639519	TPD	TPD	TPD	TPD	TPD
			TPA	TPA	TPB	TPB	TPC	TPD	TPD	TPD	TPD	TPD	TPD	TPD
			0.30	1.00	0.20	0.30	1.10	0.50	1.00	0.50	1kg TUB	1kg TUB	S	S
			250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	1kg TUB	1kg TUB	1kg TUB	1kg TUB	1kg TUB	S	S
			S	S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 7	X	X	X	X	X	X	X	X	X	X	X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
Chromium III	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
Easily Liberated Sulphide	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
PAH by GCMS	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
pH	All	NDPs: 0 Tests: 7	X	X	X	X	X	X	X	X	X	X	X	X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 7	X	X	X	X	X	X	X	X	X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 3	X	X	X	X	X	X	X	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 190313-106 Client Reference: 2187/SDI Report Number: 498071
 Location: Victoria Garage, Ruabon Order Number: 2187/SDI Superseded Report:

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
	19539519	TPD		1.00	1kg TUB	S
	19539518	TPD		0.50	60g VOC (ALE215)	S
	19539517	TPC		1.10	1kg TUB	S
	19539516	TPB		0.90	1kg TUB	S
	19539515	TPB		0.20	60g VOC (ALE215)	S
	19539514	TPA		1.00	1kg TUB	S
19539513	TPA		0.30	60g VOC (ALE215)	S	
					250g Amber Jar (ALE210)	S
					1kg TUB	S
					250g Amber Jar (ALE210)	S
					1kg TUB	S
					60g VOC (ALE215)	S
					1kg TUB	S
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CERTIFICATE OF ANALYSIS

Validated

SDG: 190313-106

Client Reference: 2187/SDI

Report Number: 498071

Location: Victoria Garage, Ruabon

Order Number: 2187/SDI

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
19539513	TPA	0.30	Dark Brown	Silt Loam	Stones	Crushed Brick
19539514	TPA	1.00	Dark Brown	Sandy Loam	Stones	None
19539515	TPB	0.20	Dark Brown	Loamy Sand	Vegetation	Stones
19539516	TPB	0.90	Light Brown	Sand	Stones	Stones
19539517	TPC	1.10	Light Brown	Sand	Stones	None
19539518	TPD	0.50	Dark Brown	Loamy Sand	Stones	None
19539519	TPD	1.00	Dark Brown	Loamy Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 190313-106 **Client Reference:** 2187/SDI **Report Number:** 498071
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Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&\$@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TPA 0.30 SOLID 12/03/2019 00:00:00 13/03/2019 12:30:00 190313-106 19539513 TM048	19/03/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TPB 0.20 SOLID 12/03/2019 00:00:00 13/03/2019 12:30:00 190313-106 19539515 TM048	19/03/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TPD 0.50 SOLID 12/03/2019 00:00:00 13/03/2019 12:30:00 190313-106 19539518 TM048	19/03/2019	Barbara Urbanek-Wals h	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



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Table of Results - Appendix

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer
TM243		Mixed Anions In Soils By Kone

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



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Test Completion Dates

Lab Sample No(s)	19539513	19539514	19539515	19539516	19539517	19539518	19539519
Customer Sample Ref.	TPA	TPA	TPB	TPB	TPC	TPD	TPD
AGS Ref.							
Depth	0.30	1.00	0.20	0.90	1.10	0.50	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	18-Mar-2019	18-Mar-2019	19-Mar-2019	18-Mar-2019	18-Mar-2019	19-Mar-2019	21-Mar-2019
Asbestos ID in Solid Samples	19-Mar-2019		19-Mar-2019			19-Mar-2019	
Chromium III	19-Mar-2019		19-Mar-2019			19-Mar-2019	
Cyanide Comp/Free/Total/Thiocyanate	19-Mar-2019		19-Mar-2019			19-Mar-2019	
Easily Liberated Sulphide	18-Mar-2019		18-Mar-2019			18-Mar-2019	
EPH CWG (Aliphatic) GC (S)	20-Mar-2019		20-Mar-2019			19-Mar-2019	
EPH CWG (Aromatic) GC (S)	20-Mar-2019		20-Mar-2019			19-Mar-2019	
GRO by GC-FID (S)	18-Mar-2019		18-Mar-2019			18-Mar-2019	
Hexavalent Chromium (s)	19-Mar-2019		19-Mar-2019			19-Mar-2019	
Metals in solid samples by OES	18-Mar-2019		18-Mar-2019			18-Mar-2019	
PAH by GCMS	20-Mar-2019		20-Mar-2019			19-Mar-2019	
pH	18-Mar-2019	15-Mar-2019	18-Mar-2019	15-Mar-2019	15-Mar-2019	18-Mar-2019	17-Mar-2019
Phenols by HPLC (S)	22-Mar-2019		23-Mar-2019			23-Mar-2019	
Sample description	15-Mar-2019	14-Mar-2019	14-Mar-2019	14-Mar-2019	14-Mar-2019	14-Mar-2019	14-Mar-2019
Total Organic Carbon	19-Mar-2019		18-Mar-2019			18-Mar-2019	
Total Sulphate	19-Mar-2019		20-Mar-2019			19-Mar-2019	
TPH CWG GC (S)	20-Mar-2019		20-Mar-2019			19-Mar-2019	
VOC MS (S)	19-Mar-2019		20-Mar-2019			19-Mar-2019	



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Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

General

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GC/FID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GC/FID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.