

Welsh Government

M4 Corridor around Newport

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Appendix 10.11 Reptile Survey
2014

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Welsh Government

M4 Corridor Around Newport

Reptile Survey Report 2014

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Appendix A

Weather Conditions During Surveys

1 Introduction

Ove Arup & Partners Ltd has been commissioned by Welsh Government to undertake baseline ecological surveys to inform proposals for the M4 Corridor around Newport. This report provides information to inform the development of the scheme, including a Design Manual for Road and Bridges (DMRB) Stage 3 environmental assessment (HA, 1993) and consideration under The Highways (Environmental Impact Assessment) Regulations 2007.

This report presents results obtained from a programme of reptile surveys completed between August and September 2014 across various habitats within the potential route corridor.

Where appropriate, recommendations are made for further surveys and design considerations to inform the development of the scheme.

1.1 Background to the Project

The M4 in South Wales forms part of the Trans-European Transport Network (TEN-T), which provides connections throughout Europe by road, rail, sea and air. The M4 plays a key strategic role in connecting South Wales with the rest of Europe, providing links to Ireland via the ports in South West Wales and England and mainland Europe to the east. It is a key east-west route being the main gateway into South Wales and also one of the most heavily used roads in Wales.

Providing a facility for transporting goods, linking people to jobs and employment sites as well as serving the Welsh tourism industry, the M4 is critical to the Welsh economy. Cardiff, Newport and Swansea have ambitious regeneration strategies and Monmouthshire County Council is developing areas around Junction 23A of the M4. Rhondda Cynon Taff has important gateways onto the motorway at Junctions 32 and 34. Bridgend is served by M4 Junctions 35 and 36. Neath Port Talbot straddles the motorway and gets important access from Junctions 38 to 43. Congestion on the M4 causing unreliable journey times and reduced service levels will therefore hinder economic development in South Wales.

The M4 between Junctions 28 and 24 was originally designed as the 'Newport Bypass' with further design amendments in the 1960s to include the first motorway tunnels to be built in the UK.

The M4 Motorway between Magor and Castleton does not meet modern motorway design standards. This section of the M4 has many lane drops and lane gains, resulting in some two-lane sections, an intermittent hard shoulder and frequent junctions.

It is often congested, especially during weekday peak periods resulting in slow and unreliable journey times and stop-start conditions with incidents frequently causing delays.

This is why problems with congestion and unreliable journey times have been a fact of life on the M4 around Newport for many years. The motorway and surrounding highway network does not cope with sudden changes in demand or operation, for example as a result of accidents or extreme weather events. These

issues are worse at times of peak travel (rush hour) and have worsened as the number of users on the network has increased.

Since 1991, much assessment and consultation has been undertaken to develop a preferred solution to the problems on the motorway around Newport. A detailed history is documented in the M4 Corridor around Newport WelTAG (WG, 2008) Stage 1 (Strategy Level) Appraisal Report (Ove Arup & Partners Ltd, 2013). This included the adoption of a revised TR111 route¹ in April 2006, which remains protected for planning purposes. The alignment of this proposed new section of motorway has been developed following extensive consultation, investigation and analysis. The aim was to minimise the impact on the environment, whilst fully meeting motorway design and safety standards. The main element of the Plan (the Black Route) largely follows this TR111 alignment.

The survey design is informed by the Route Options defined in the Stage 2 DRMB Environmental Report (Ove Arup & Partners Ltd, 2014).

1.2 Aims and Objectives

The survey was conducted with two objectives:

1. To gain an understanding of the reptile assemblage present within representative habitats within the study area, assessing the species present within different habitat types;
2. To highlight any key species or habitats of particular value that may influence the design of the project.

1.3 Study Area

The study area for the purpose of this survey was based on a 500m buffer around the physical extents of the previous scheme studied in 2007/8 including the route alignment, potential junctions and water treatment areas. The preferred route announced by Welsh Government in July 2014 is located within the centre of this corridor as shown on Figure 1.

¹ Once a preferred route is announced, Welsh Government serves a statutory notice (TR111) on the local planning authorities requiring the line to be protected from development. This is enacted under Article 19 of The Town & Country Planning (Development Management Procedure) (Wales) Order 2012.

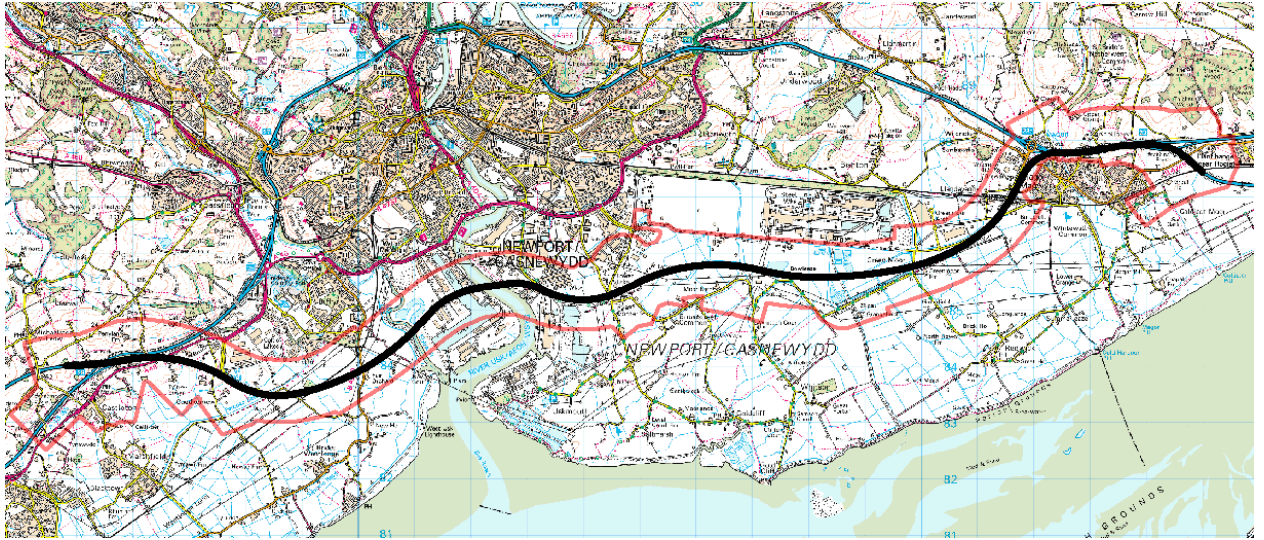


Figure 1 The 2014 Preferred Route within the Study area shown in red.

1.4 Legislation

All British reptiles are protected from the intentional killing, injuring and sale under Section 5 of the Wildlife and Countryside Act 1981 (as amended). These species include adder (*Vipera berus*), grass snake (*Natrix natrix*), slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*).

These reptile species are now included within the list published in response to Section 42 of the Natural Environment & Rural Communities (NERC) Act 2006. Section 42 (S42) of the Act requires the Secretary of State for Wales to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in Wales. The list (known as the S42 list) has been drawn up in consultation with the Countryside Council for Wales (now National Resource for Wales), as required by the Act. The S42 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40 of the Act, to have regard to the conservation of biodiversity in Wales, when carrying out their normal functions.

2 Methodology

2.1 Desk Study

Historical biodiversity data were provided by SEWBReC (South East Wales Biodiversity Records Centre) on 05 December 2013. This included a search for all reptile records from the study area and a 2km buffer.

2.2 Site Selection

As outlined in Section 1.2, this survey aimed to gain an understanding of the reptile assemblage present within representative habitats within the study area. A survey of all habitats within the study area that could support reptiles was not considered appropriate; it can be assumed that grass snake are likely to be present throughout the Gwent Levels in suitable habitats, particularly along reens and associated riparian corridors.

The representative sample of habitats was selected based on the results of desk study records, previous survey information and assessment of habitat quality/potential obtained from the Phase 1 Habitat surveys undertaken for the project. Ten areas were selected for survey and these are summarised in Table 1 below.

Table 1 Summary of Areas Surveyed

Area Number	Key Habitats
1	An area of waste ground which contains a large pond. Refugia were placed close to spoil heaps in grassland and scrub habitat.
2	An area of waste ground with established scrub, tall ruderal and grassland habitats. Refugia were placed within areas of grassland which bordered the scrub.
3	Grassland and scrub habitat adjacent to railway line, and used as a storage area for vehicles (car park). Refugia were placed within marginal grassland vegetation.
4	Mosaic of habitat types including scrub, tall ruderal and open grassland.
5	Site was previously industrial, now overgrown with dense scrub, open grassland habitats. Refugia were placed in grassland adjacent to scrub.
6	Mosaic of scrub and pond habitat with grassy areas. Refugia were placed in open areas adjacent to an access track, close to the scrub and ponds.
7	Refugia were placed alongside reens and ditches within the land south of Tata steelworks. Habitats included scrub, waste ground, reens and tall grassland.
8	Area of scrub and grassland lying adjacent to reen. Refugia were placed along the reen banks and in open grassland areas.
9	Broad-leaved woodland and open grassland mosaic. Refugia were placed in open sunny areas.
10	Mosaic of scrub and grassland habitats. Refugia were placed in open sunny parts of the area adjacent to scrub.

The areas selected for inclusion within the surveys area also shown on **Plans 1-7** that accompanies this report. These plans also show refugia locations.

2.3 Field Survey Methods

The methodology used in this survey followed standard guidance for reptile surveys (Froglife, 1999). The methodology involved the placement of artificial refugia within suitable areas of habitat for reptiles. The refugia used during the survey were made from rectangles of roofing felt measuring approximately 1m x 0.5m with a placement density of approximately 5-10 refuges per hectare of within suitable habitat in each area. Areas of suitable reptile habitat were targeted for survey and included south facing slopes, areas of short vegetation close to scrub and suitable hibernation habitat including rubble/wood piles and mounds of crushed aggregate where present.

A total of 300 refugia were installed on 15th-18th July, at least four weeks prior to survey commencement, to allow the refugia to settle and increase the chance of use by reptile populations. The positions of all refuges were recorded via GPS on tablet computers. These were subsequently used to record results of the reptile survey.

Seven subsequent survey visits were carried out between 27th August and the 30th September 2014, by ecologists experienced in conducting reptile surveys. At the completion of the survey, all refugia were removed from the study area.

The artificial refugia were checked during early to late morning and/or early afternoon with a starting air temperature of between 13°C until a maximum of 19°C. The weather conditions for each survey visit are provided in **Appendix A**.

In addition any pre-existing suitable artificial or natural refugia on site were also checked as part of the survey. Each refuge was lifted carefully to search for reptile species and, where feasible, details of the reptile species, sex, age class and condition of the reptiles encountered were recorded. Once the reptiles had been allowed to escape, the refugia were replaced.

Additional signs of reptile presence such as sloughed skins were also recorded where evident and any live animals observed away from refugia were also recorded.

2.4 Reporting Methods

The data gathered during field survey work has been displayed on plans, combining that obtained from each survey visit in order to reveal patterns of reptile distribution within each study area. These results are then discussed within the Baseline Environment section of this report.

2.5 Limitations and Assumptions

Reptiles are mobile species, therefore no account can be made on a particular day as to the presence / absence of a particular species. Certain reptile species have large home ranges and may occur as transient individuals on sites connected to wider areas that support these species. However, the survey effort undertaken here is anticipated to have detected those reptile species present within the survey area.

It should be stressed though that the findings presented in this study represent those at the time of survey and reporting, and data collected from available

sources. Ecological surveys are limited by factors which affect the presence of species, such as weather conditions, migration patterns and behaviour.

Nevertheless, these surveys were conducted at the optimal survey period and using methodologies which were discussed and agreed with National Resource for Wales (NRW) in March 2014. Every effort has been made to ensure that the findings of the study present as accurate an interpretation as possible of the status of reptiles within the study area.

3 Baseline Environment

3.1 Desk Study

Table 2 displays the results for all reptiles within 2km of the survey area, from the period 2000-2013.

Table 2 Historical records for reptiles post 2000.

Location	Approximate distance (km) survey boundary	Direction from survey boundary	Date	Comments
Slow-worm, <i>Anguis fragilis</i>				
Marshfield	0.8	South	2008	1 record
Stow Park	1.8	North	16 Jun 2013	2 adult female; 1 juvenile
Gaer Fort	1.9	North	18 May 2013	5 adult female; 4 adult male; 1 juvenile
Stow Park	2	North	15 Aug 2006	5 counts
Grass snake, <i>Natrix natrix</i>				
Marshfield - Uskmouth Power Site	Within	Within	May – Oct 2007	1 count
Marshfield - Uskmouth Power Site	Within	Within	May – Oct 2007	1 count
Wentlooge Level	0.1	South	Apr – Sep 2007	1 count dead
Marshfield - Uskmouth Power Site	0.2	South	May – Oct 2007	1 count,
Marshfield - Uskmouth Power Site	0.3	South	May – Oct 2007	2 counts
St Mellons	0.4	South	9 Aug 2005	1 count dead
Newport Wetlands, Little Cross Farm	0.4	South	26 Jul 2010	1 count dead
Newport Wetlands, Little Cross Farm	0.4	South	28 Jun 2005	1 count dead
Julian's Gout – Alphasteel	0.8	South	25 Aug 2004	1 adult
Magor Marsh	0.9	South	06 Oct 2010	1+ count

Newport Wetlands, St Brides	0.9	South	03 Jul 2009	1 count dead
Duffryn	0.9	North	2000	Several counts
Newport Wetlands, West Nash Road	1	South	17 Aug 2004	1 count dead juvenile
Newport Wetlands, Farmfield Lane	1.2	South	16 Jul 2007	1 count dead
Newport Wetlands, Field Block 13	1.4	South	12 May 2003	1 record
Newport Wetlands	1.5	South	13 Oct 2008	1 count
Gwent Levels-Uskmouth	1.8	South	20 Sep 2009	1 count
Newport Wetlands, Uskmouth	1.8	South	07 Jun 2006	1 count
Newport Wetlands, Uskmouth	1.8	South	14 Jul 2007	1 count
Newport Wetlands, Uskmouth	1.8	South	19 Jun 2001	1 count
Newport Wetlands, Uskmouth	1.8	South	24 May 2006	2+ counts
Newport Wetlands, Uskmouth	1.8	South	27 Apr 2004	1 record
Newport Wetlands, Goldcliff	2	South	07 Jul 2009	1 count
Adder, <i>Vipera berus</i>				
Parc Golf Club, Newport	Within	Within	2005	Several counts
Marshfield - Uskmouth Power Site	0.3	South	May – Oct 2007	1 count
Slade Wood, Rogiet	0.4	North	01 Jul 2007	Several counts
Common lizard, <i>Zootoca vivipara</i>				
Marshfield - Uskmouth Power Site	0.2	South	May – Oct 2007	1 count
Marshfield	0.8	South	2008	1 record

Liswerry, Newport	0.9	North	01 May 2009	<10 counts all life stages,
Coldra Road, Newport	1.8	North	06 Apr 2011	1 count dead
Gaer Fort	2	North	15 Jun 2013	1 adult male
Cae Perllan Allotments, Newport	2	North	15 Aug 2006	4 counts

3.2 Field Surveys

A total of 36 reptile observations were made during the entire survey period. Records came from six of the ten survey areas. All reptile observations are listed in Table 3 below and shown on **Plans 8-13**.

Table 3: Reptile Field Survey Results

Species	Area	Date	Sex/Life Stage	Number
Grass snake	2	27 th August	Adult	1
Grass snake	3	27 th August	Large recent slough, probably female	1
Grass snake	3	27 th August	Small juvenile	1
Grass snake	5	28 th August	Adult	1
Grass snake	5	28 th August	Juvenile	1
Grass snake	5	28 th August	Juvenile	1
Grass snake	7	29 th August	Sub-adult	1
Grass snake	7	29 th August	Sub-adult	1
Grass snake	7	29 th August	Adult	1
Grass snake	7	29 th August	Sub-adults	2
Grass snake	7	29 th August	Slough	1
Grass snake	3	10 th September	Sub-adult	1
Common lizard	9	11 th September	Adult	1
Common lizard	5	12 th September	Adult	1
Grass snake	5	12 th September	Slough	1
Grass snake	5	12 th September	Juvenile	1
Grass snake	4	12 th September	Juvenile	1
Grass snake	4	12 th September	Adult	1
Grass snake	3	16 th September	Sub-adult	1
Grass snake	4	16 th September	Juvenile	1
Grass snake	4	16 th September	Sub-adult	1
Grass snake	4	16 th September	Juvenile	1
Grass snake	7	17 th September	Juvenile	1
Grass snake	7	17 th September	Juvenile	1
Grass snake	3	19 th September	Adult	1
Grass snake	2	19 th September	Juvenile	1
Grass snake	5	22 nd September	Juvenile	1
Grass snake	4	22 nd September	Adult	1
Grass snake	5	23 rd September	Juvenile	1
Grass snake	4	23 rd September	Juvenile	1
Grass snake	5	24 th September	Juvenile	1
Grass snake	4	24 th September	Adult	1

Grass snake	7	29 th September	Adult	1
Grass snake	7	29 th September	Juvenile	1
Grass snake	5	30 th September	Juvenile	1
Grass snake	4	30 th September	Juvenile	1

An incidental sighting of a grass snake was also made during bat detector monitoring work for the project. A single animal was seen within Area 4 on 9th September.

In addition to reptiles, two species of amphibians were recorded during the surveys. The most abundant species was common toad (*Bufo bufo*) which was recorded 68 times. Most record came from Area 1 (51 observations) followed by 12 observations in Area 2. This species was also recorded twice in Areas 8 and 9 and once in Area 4. The highest number of common toads recorded under any one refugia was four (all small juveniles) on 27th August in Area 1.

The other species recorded was common frog (*Rana temporaria*) which was recorded on three occasions, on 10th, 16th and 19th September, all from Area 1. All observations were of single animals.

4 Conclusions and Recommendations

The 2014 reptile survey covered ten separate areas of potentially suitable habitat within the defined study area. The survey included a programme of seven visits between late August and September, carried out in favourable weather conditions.

Two species of reptiles were recorded. The most frequently recorded species was grass snake, recorded in five areas (Areas 2, 3, 4, 5 and 7). The highest number of animals seen on any single visit in one area was five, on 28th August in Area 7. Overall, small numbers of snakes were recorded infrequently during the survey and were not recorded in half of the areas surveyed. As described above, taking a precautionary approach it can be assumed that grass snakes are present in low numbers throughout the study area within suitable habitats.

Two adult common lizard were recorded in Area 9 on 11th September and Area 5 on 12th September. There were no records of adder or slow worm during the survey.

4.1 Recommendations

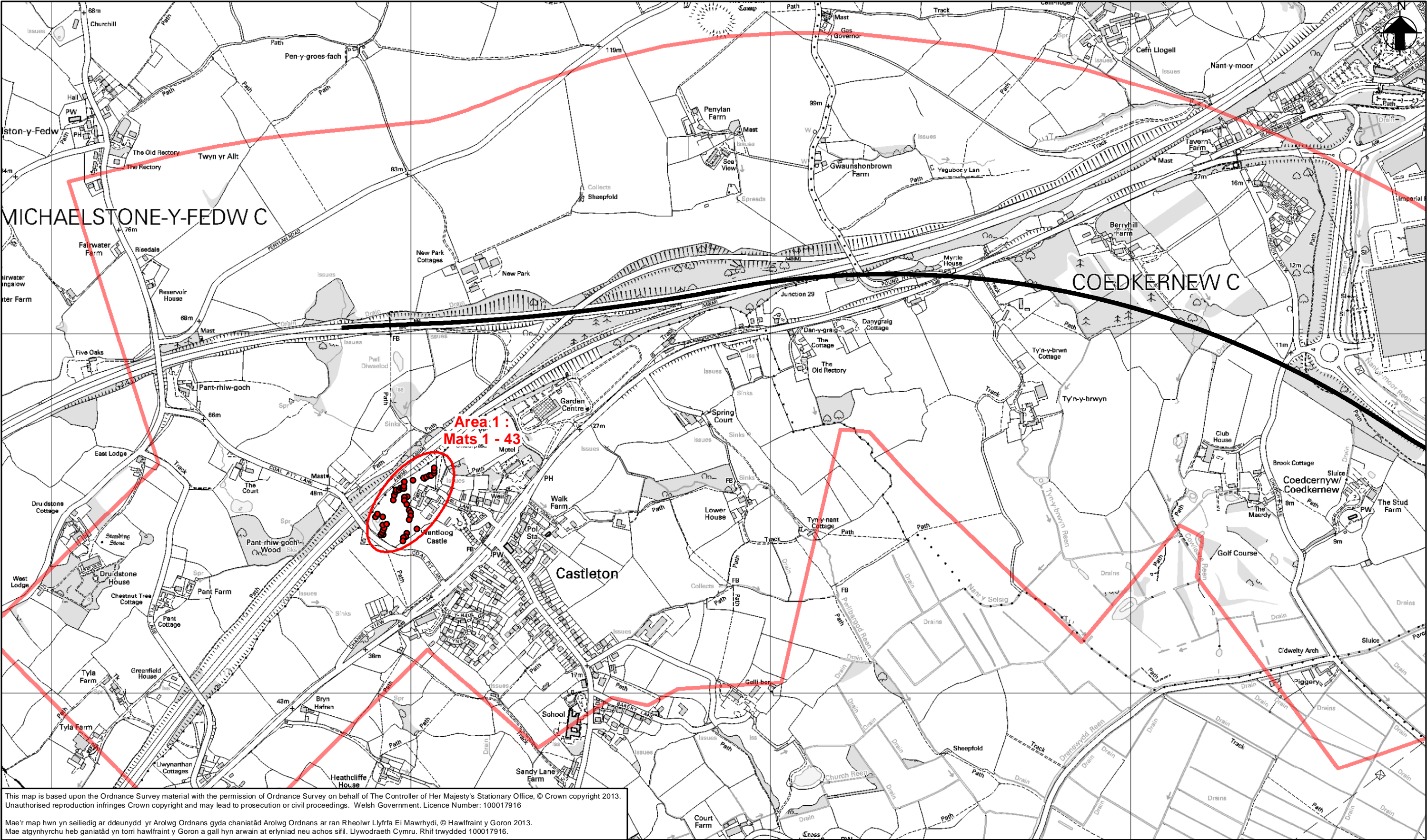
It is recommended that during the design process habitat retention, protection and if necessary replacement and enhancement measures are implemented along the route.

Due to their legal protection, mitigation for reptiles should be designed into the project, including any necessary measures to avoid killing of reptiles during construction.

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Drawings




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- Study Area
- Reptile Survey Areas
- Reptile Mats
- M4 CAN Plan Route

					
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Job Title

M4 Corridor Around Newport

Coridor yr M4 o amgylch Casnewydd

Metres

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Scale at A3

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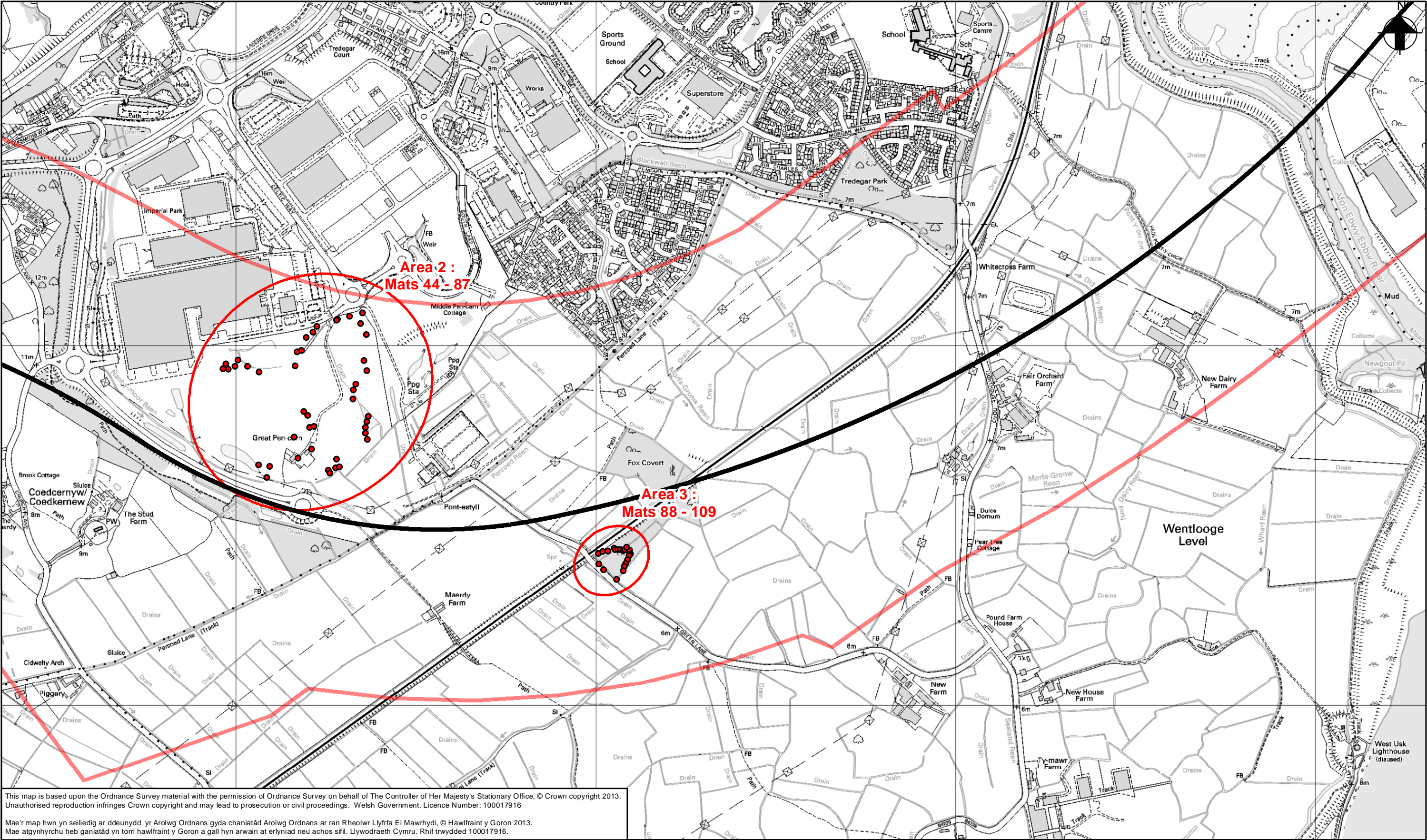
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Drawing Title

**Plan 1
Reptile Survey**

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Legend

- Study Area
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- M4 CAN Plan Route

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Job Title

M4 Corridor Around Newport

Coridor yr M4 o amgylch Casnewydd

Metres

Scale at A3

1:10,000

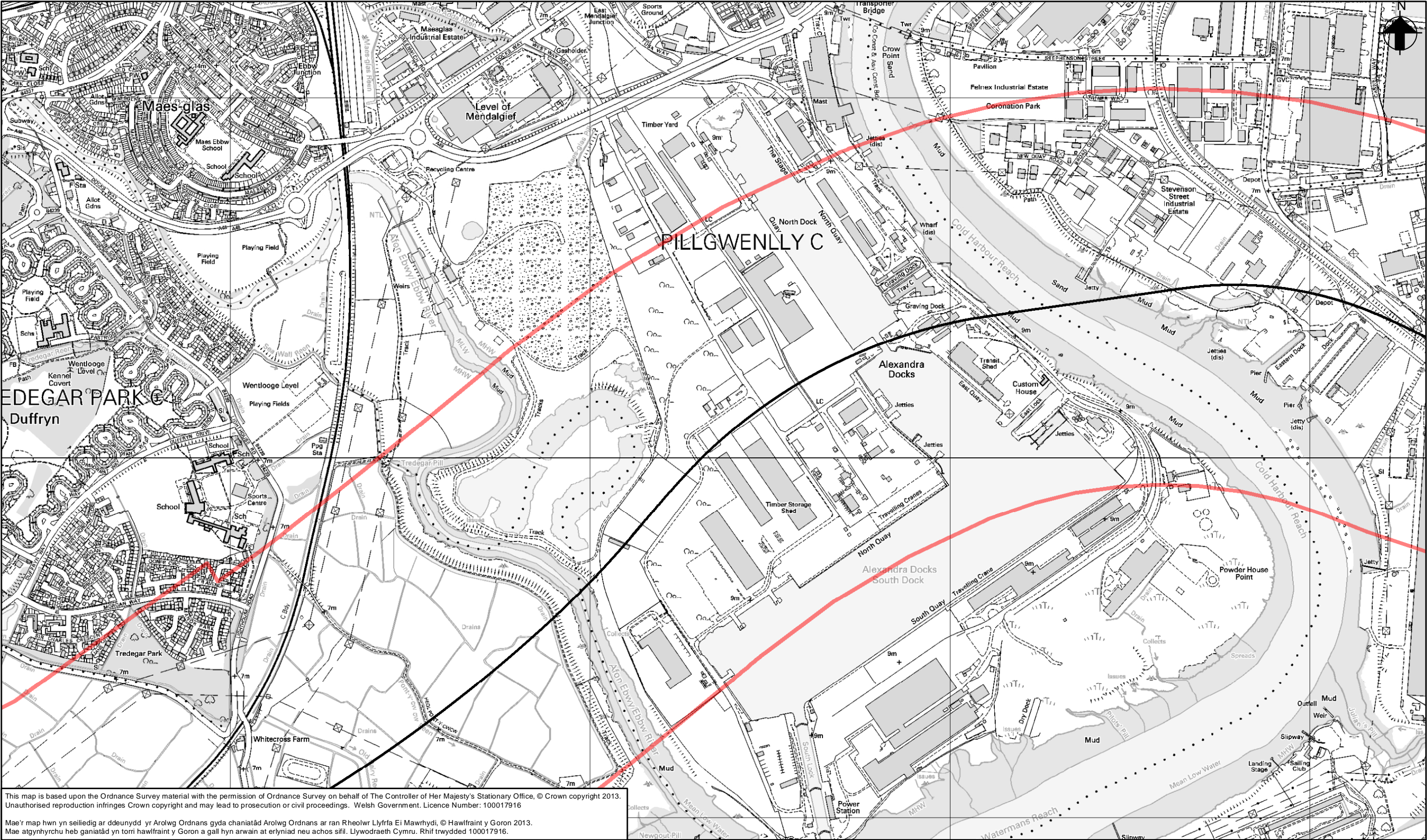
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**Plan 2
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Legend

- Study Area
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Job Title

M4 Corridor Around Newport

Coridor yr M4 o amgylch Casnewydd

Metres

0 125 250

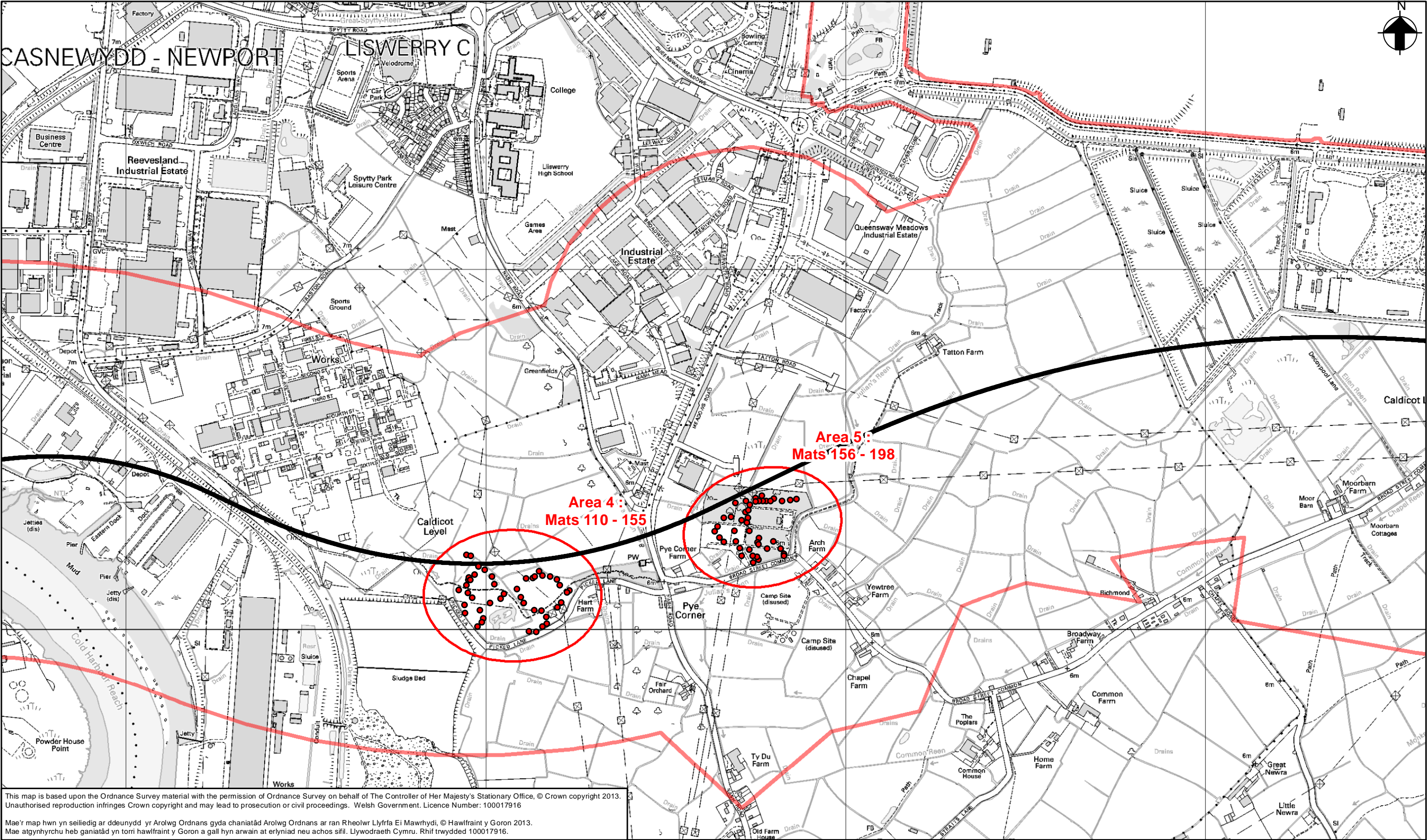
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Study Area

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Reptile Mats

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M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd

Metres

0 125 250

Scale at A3

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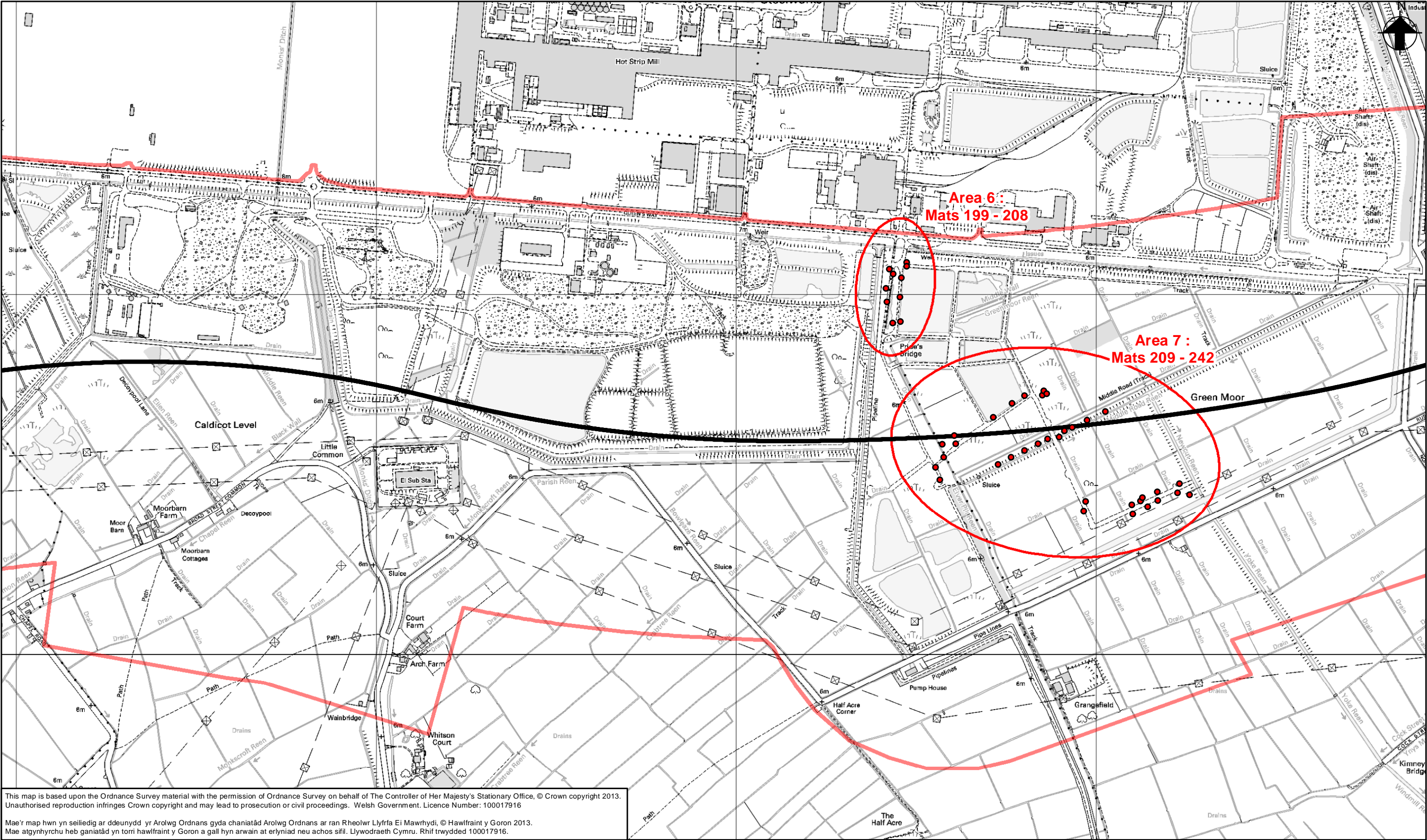
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F2



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Legend

Study Area

Reptile Survey Areas

Reptile Mats

M4 CAN Plan Route

F2	2014-06-30	EB	TR	HP
For Issue				
Issue	Date	By	Chkd	Appd

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Parc Cathays
Caerdydd
CF10 3NQ

Job Title

M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd

Metres

0 125 250

Scale at A3

1:10,000

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Drawing Title

Plan 5
Reptile Survey

Job No

117300-01

Drawing Status

For Issue

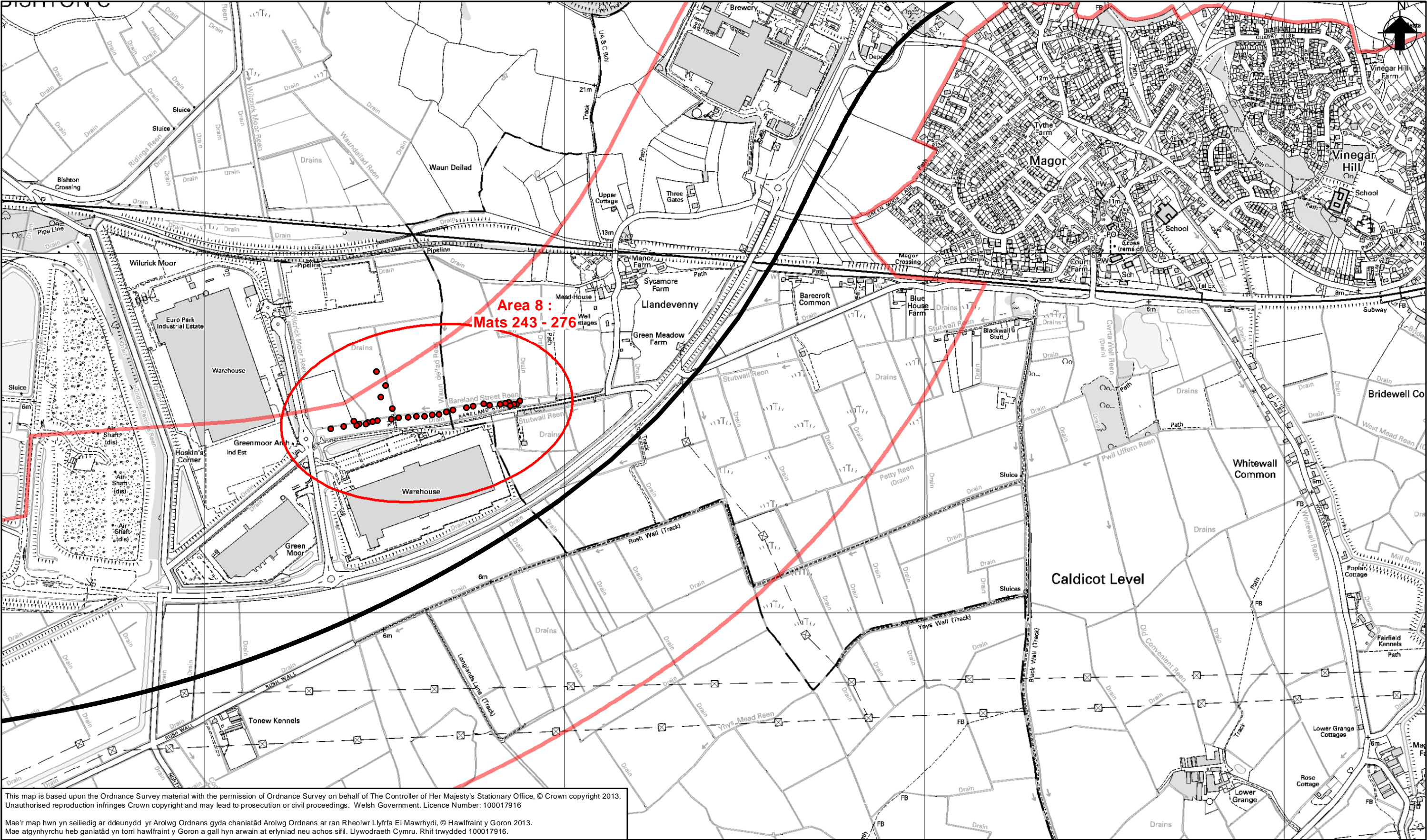
Drawing No

M4-OA-01-00-DR-Z-RP-0012

Issue

F2

I:\global\Europe\Cardiff\Jobs\117000\117300-01\4 Internal Project Data\4-80 GIS\4-84 Map Documents\ENV_Environment\Ecology\Reptile Survey 2014_v4.mxd © Arup



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Legend

- Study Area
- Reptile Survey Areas
- Reptile Mats
- M4 CAN Plan Route

F2	2014-06-30	EB	TR	HP
For Issue				
Issue	Date	By	Chkd	Appd

Client

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Job Title

M4 Corridor Around Newport

Coridor yr M4 o amgylch Casnewydd

Metres

Scale at A3

1:10,000

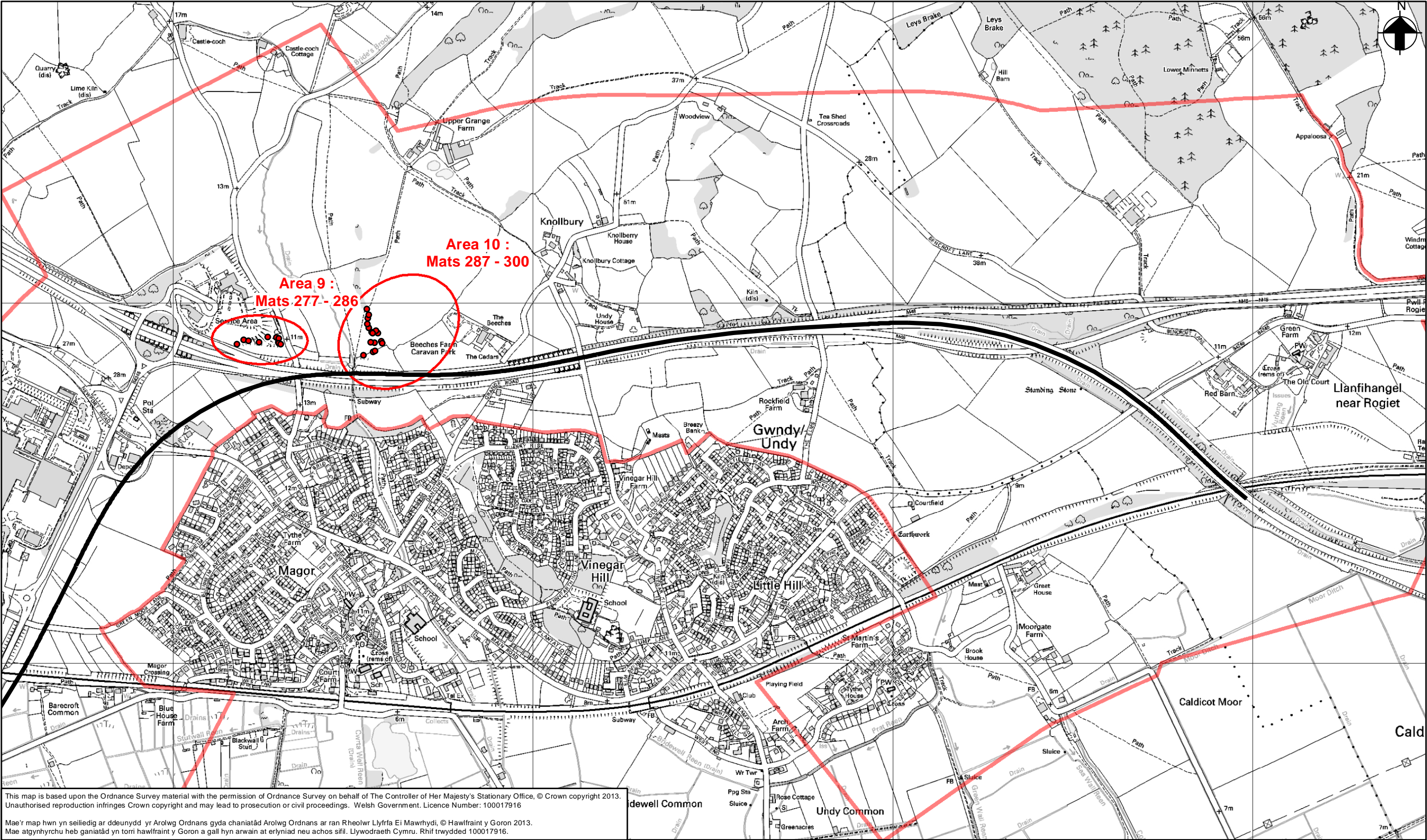
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Drawing Title

**Plan 6
Reptile Survey**

Job No	Drawing Status
117300-01	For Issue
Drawing No	Issue
M4-OA-01-00-DR-Z-RP-0013	F2



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Legend

- Study Area
- Reptile Survey Areas
- Reptile Mats
- M4 CAN Plan Route

F2	2014-06-30	EB	TR	HP
For Issue				
Issue	Date	By	Chkd	Appd

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Trafnidiaeth
Llywodraeth Cymru
Parc Cathays
Caerdydd
CF10 3NQ

Job Title

M4 Corridor Around Newport

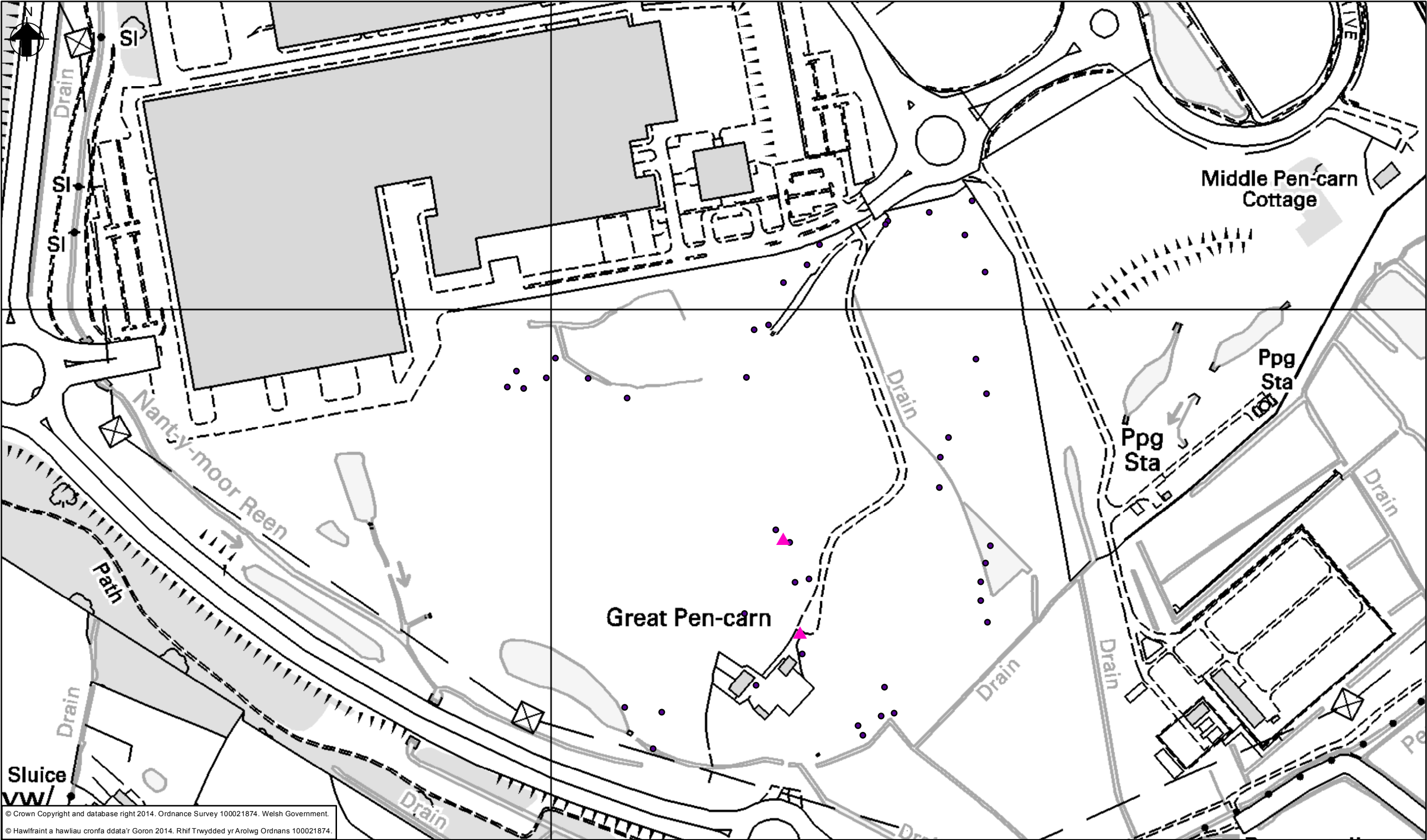
Coridor yr M4 o amgylch Casnewydd

Scale at A3

1:10,000

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Drawing Title	
Plan 7 Reptile Survey	
Job No	Drawing Status
117300-01	For Issue
Drawing No	Issue
M4-OA-01-00-DR-Z-RP-0014	F2



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Legend

- Reptile Mats
- ▲ Common Lizard
- ▲ Grass snake

F2	2014-10-22	PW	PW	PW
For Issue				
Issue	Date	By	Chkd	Appd

Client



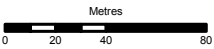
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Job Title

M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd



Scale at A3
1:3,000

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Drawing Title

Plan 8
Reptile Survey Results - Area 2

Job No

117300-01

Drawing Status

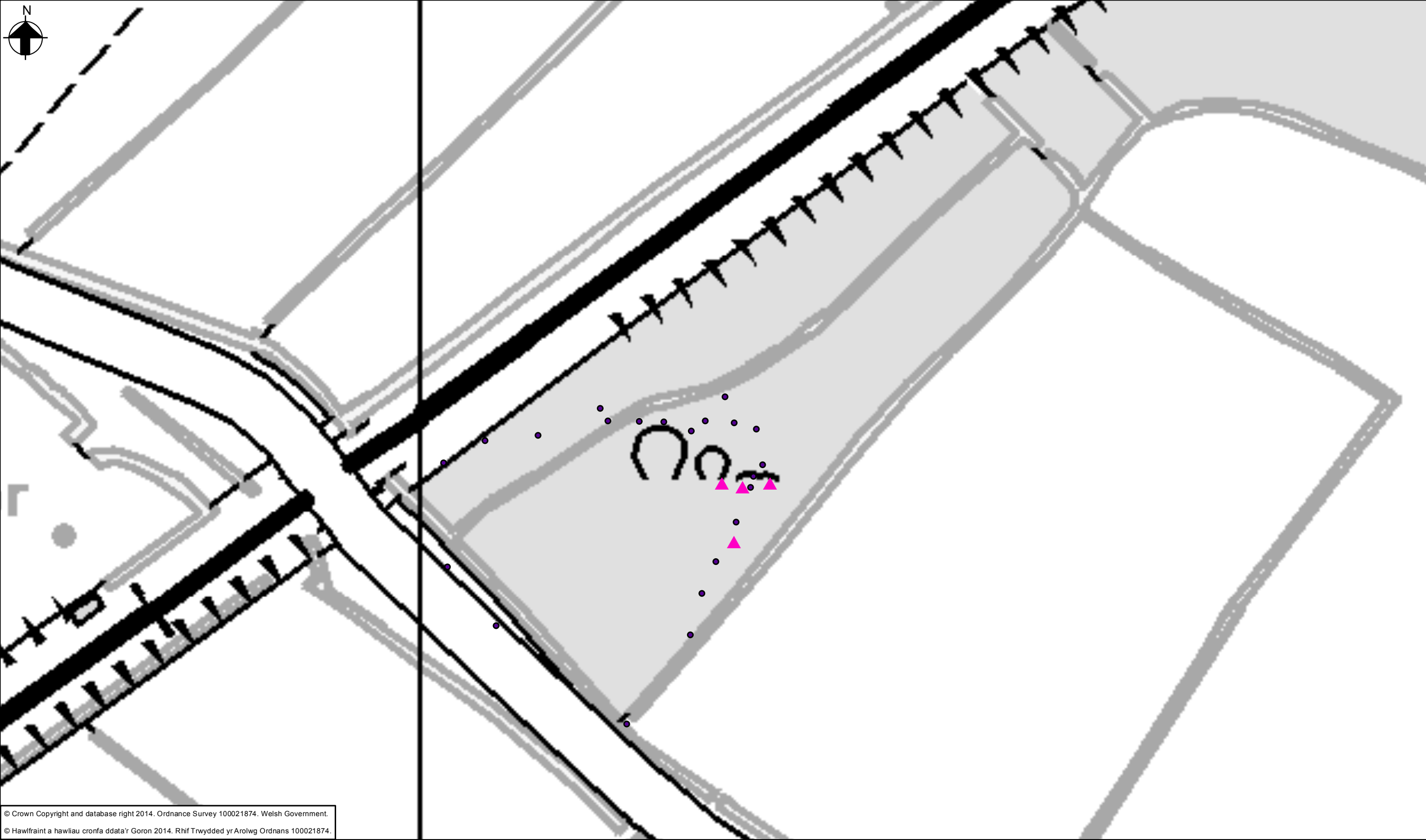
For Issue

Drawing No

M4-OA-01-00-DR-Z-RP-0003

Issue

F2



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Legend

- Reptile Mats
- ▲ Common Lizard
- ▲ Grass snake

F2	2014-10-22	PW	PW	PW
For Issue				
Issue	Date	By	Chkd	Appd

Client



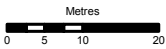
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Caerdydd
CF10 3NQ

Job Title

M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd



Scale at A3
1:1,000

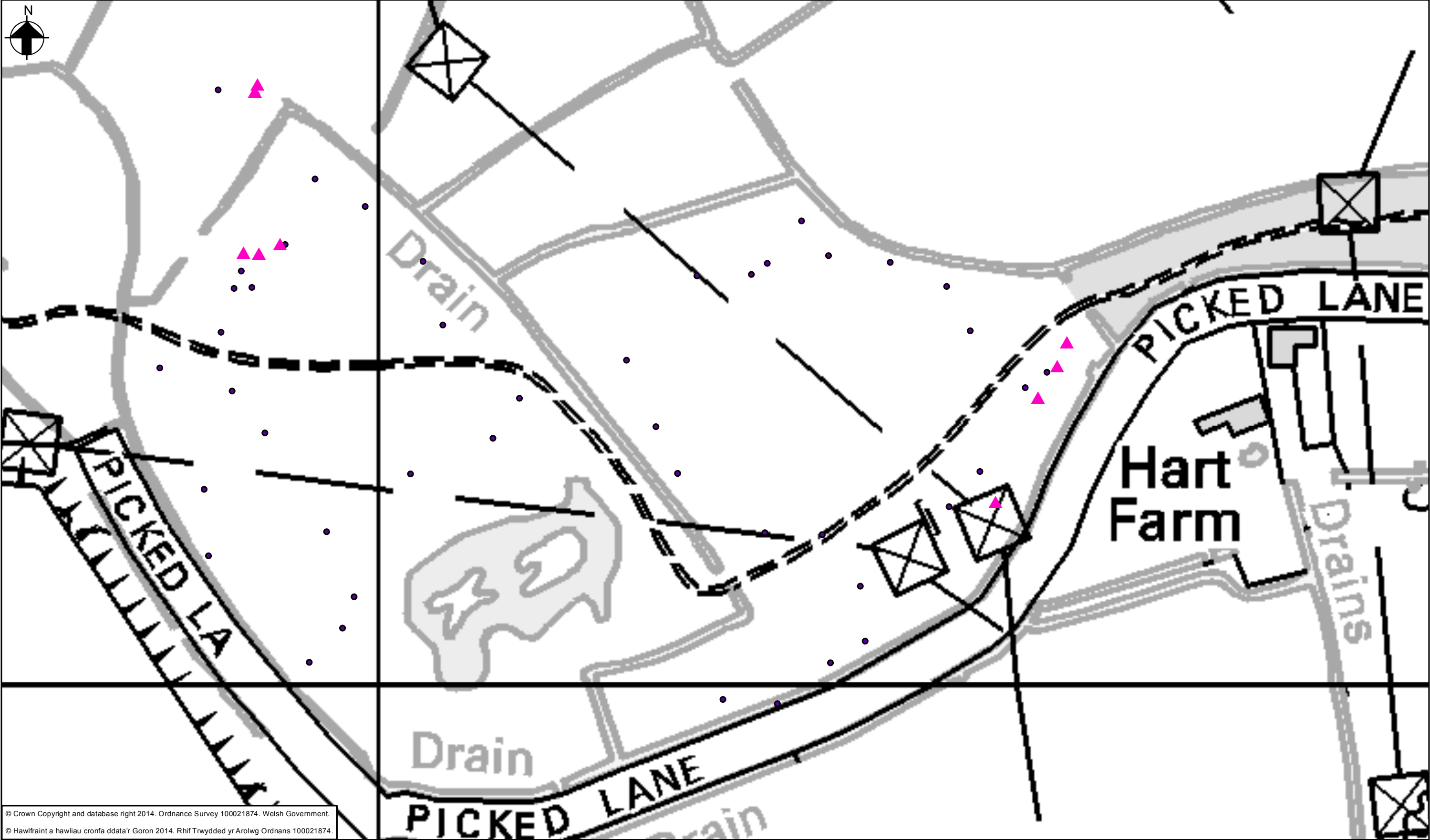
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Drawing Title

Plan 9
Reptile Survey Results - Area 3

Job No	Drawing Status	Issue
117300-01	For Issue	F2
Drawing No		
M4-OA-01-00-DR-Z-RP-0004		



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Legend

- Reptile Mats
- ▲ Common Lizard
- ▲ Grass snake

F2	2014-10-22	PW	PW	PW
For Issue				
Issue	Date	By	Chkd	Appd

Client



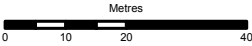
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Caerdydd
CF10 3NQ

Job Title

M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd



Scale at A3
1:1,250

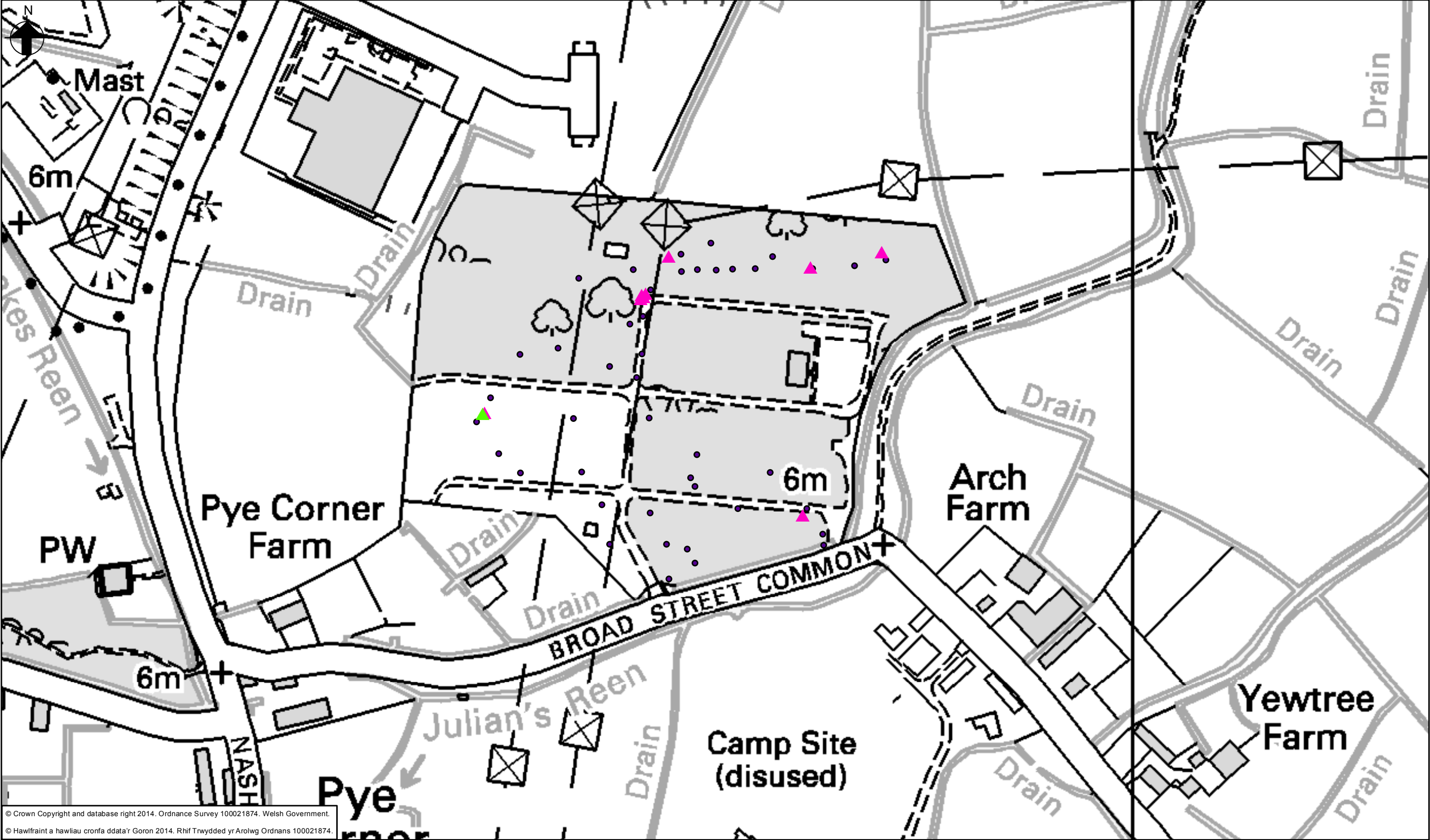
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Drawing Title

Plan 10
Reptile Survey Results - Area 4

Job No	Drawing Status	Issue
117300-01	For Issue	F2
Drawing No		
M4-OA-01-00-DR-Z-RP-0005		



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Legend

- Reptile Mats
- ▲ Common Lizard
- ▲ Grass snake

F2	2014-10-22	PW	PW	PW
For Issue				
Issue	Date	By	Chkd	Appd

Client



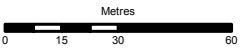
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Caerdydd
CF10 3NQ

Job Title

M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd



Scale at A3
1:2,000

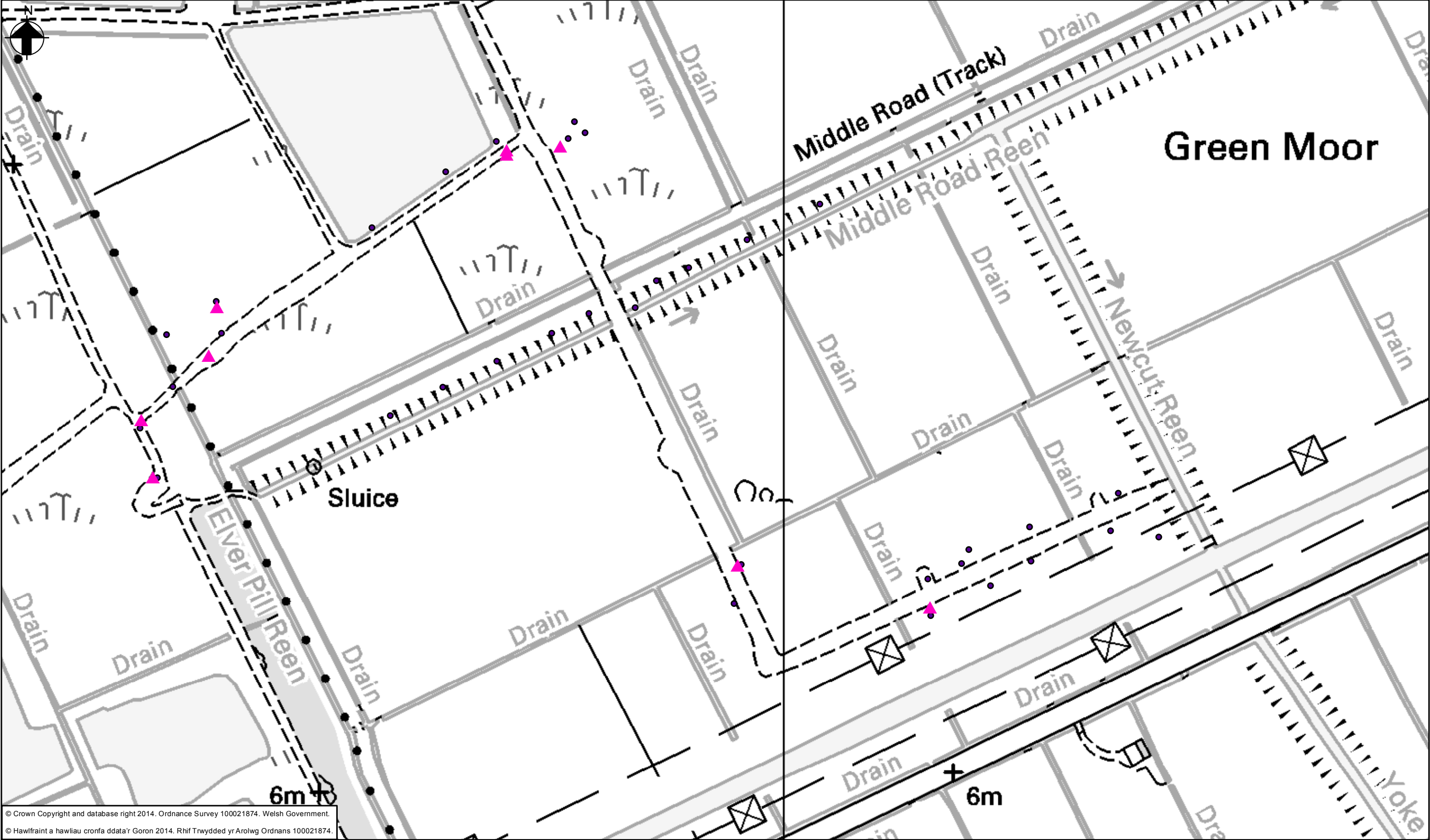
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Drawing Title

Plan 11
Reptile Survey Results - Area 5

Job No	Drawing Status	Issue
117300-01	For Issue	F2
Drawing No		
M4-OA-01-00-DR-Z-RP-0006		



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Legend

- Reptile Mats
- ▲ Common Lizard
- ▲ Grass snake

F1	2014-10-22	PW	PW	PW
For Issue				
Issue	Date	By	Chkd	Appd

Client



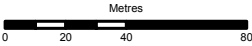
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Welsh Government

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Welsh Government
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Trafnidiaeth
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Caerdydd
CF10 3NQ

Job Title

M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd



Scale at A3
1:2,500

ARUP

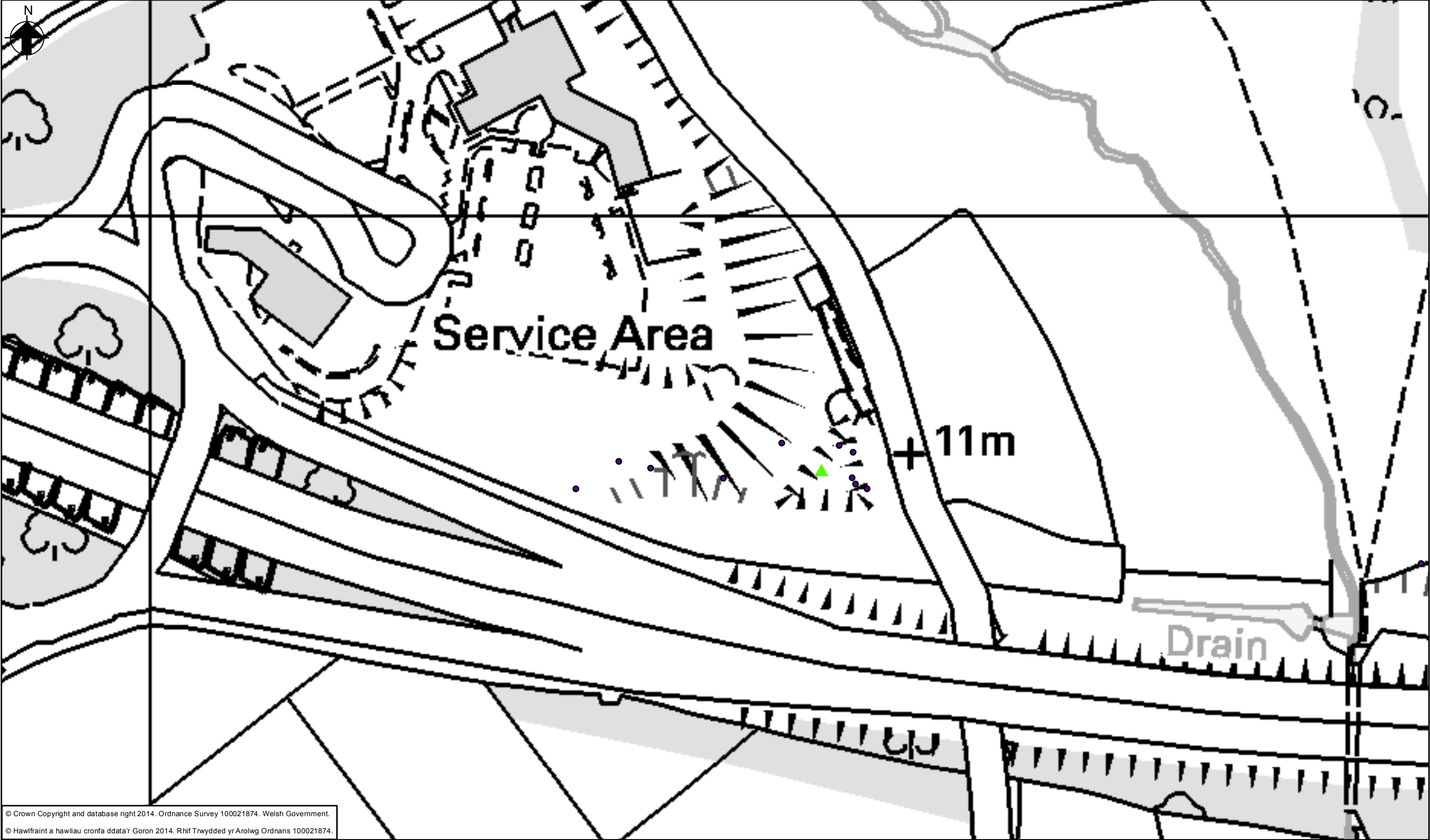
4 Pierhead Street, Capital Waterside
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T +44(0)29 20473727 F +44(0)29 20472277
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Drawing Title

Plan 12
Reptile Survey Results - Area 7

Job No	Drawing Status
117300-01	For Issue

Drawing No	Issue
M4-OA-01-00-DR-Z-RP-0007	F1




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Legend

- Reptile Mats
- ▲ Common Lizard
- ▲ Grass snake

F1	2014-10-22	PW	PW	PW
For Issue				
Issue	Date	By	Chkd	Appd

Client

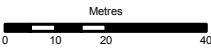


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Job Title
M4 Corridor Around Newport
Coridor yr M4 o amgylch Casnewydd



Scale at A3
1:1,500

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Drawing Title
Plan 13
Reptile Survey Results - Area 9

Job No 117300-01	Drawing Status For Issue	Issue F1
Drawing No M4-OA-01-00-DR-Z-RP-0008		

Appendix A

Weather Conditions During Surveys

Date	Temperature (°C)	Wind Speed (Beaufort)	Wind Direction	Cloud Cover (%)	Conditions
27.08.14	17	1	SE	40	Sunny
28.08.14	17.5	1	SW	100	Light showers
29.08.14	16	4	SW	90	Dry
08.09.14	19	1	SE	10	Sunny
09.09.14	19	1	NE	5	Sunny
10.09.14	19	1	SE	0	Sunny
11.09.14	13	2	NE	5	Sunny
16.09.14	19	3	E	60	Dry
17.09.14	18	3	W	65	Dry
19.09.14	17	2	NE	100	Dry
22.09.14	18	1	SW	10	Dry
23.09.14	17	1	SW	20	Sunny
24.09.14	18	1	NW	50	Sunny
29.09.14	18	1	SW	80	Dry
30.09.14	18	2	S	30	Dry