Kent International Gateway
Great Crested Newt Survey

Kent International Gateway Limited

December 2006

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Contents

1 Introduction

1.1 BACKGROUND INFORMATION

1.1.1 This report outlines the findings of great crested newt surveys undertaken to date at a proposed development site near Hollingbourne in Kent and is one of a series of baseline ecological reports that are intended to inform and Environmental Impact Assessment of the proposed development.

1.1.2 The proposed scheme is a large, primarily business development that would be situated to the west of Hollingbourne (centred at National Grid Reference TQ815 55). The application site is bounded by the M20 to the north and the A20 and a railway line to the south. The site covers approximately 125 hectares and the location is shown on Figure 1. The site comprises arable land and grassland with some areas of semi-natural and plantation woodland and a network of hedgerows and scattered trees.

1.1.3 In order to inform the design stages of the proposed development, a series of ecological studies have been carried out to establish the ecological baseline of the site and to identify any potential constraints to development.

1.1.4 During May 2004 WSP undertook a field survey of part of the land within the proposed scheme. During this survey, suitable habitat for great crested newt was identified in the form of ponds and wet ditches linked to woodland areas both on and adjacent to the site. Great crested newt surveys were undertaken in the identified ponds between March-June 2005. It was not possible to establish access to all ponds in the area for the necessary number of repeat visits required by best practice guidelines (English Nature, 2001). Furthermore, the area of land to be considered as part of the proposed application extended to incorporate hitherto un-surveyed areas. For these reasons additional surveys were undertaken during 2006.

1.1.5 Records of great crested newts from within 2km of the development site have been received from the Kent and Medway Biological Records Centre. These records are for the following 1km squares: TQ7954, TQ7957, TQ7855 and TQ8155. The 1km grid square TQ8155 includes the proposed development area and it is likely that this record originates from a waterbody either on or close to the development boundary. No further records have been highlighted from consultation responses.

1.2 LEGISLATIVE CONTEXT

1.2.1 The great crested newt and any place it uses for shelter or protection are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended by the CROW Act 2000). This prohibits the killing and injury of the species but also the intentional or reckless damage of any place used for shelter or protection by the species, obstruction of access to such places of shelter and disturbance to the species whilst occupying a place of shelter.

1.2.2 The great crested newt is also protected under European legislation which is implemented through The Conservation (Natural Habitats, &c.) Regulations 1994 (known as the Habitat Regulations). The great crested newt is listed in these regulations as a European protected species and under regulation 39 of the Habitat Regulations it is an offence to:

- Deliberately capture or kill any animal of a European protected species;
- Deliberately disturb any such animal;
- Deliberately take or destroy the eggs of such an animal; or
- To damage or destroy the breeding site or resting place of such an animal.

1.2.3 The presence of a protected species is a 'material consideration' in planning terms and development of areas of land containing this species may often only proceed under a European Protected Species licence issued by Natural England. Licences for development purposes are issued under the Habitat Regulations (1994) and only allow what is permitted within the terms and conditions of the licence.

1.3 SURVEY AIMS AND OBJECTIVES

1.3.1 The aim of the surveys was to confirm the presence or absence of great crested newts within suitable habitat both on and adjacent to the proposed development site.

2 Methodology

2.1 FIELD SURVEY

2.1.1 Surveys were undertaken following survey techniques described in Great Crested Newt Mitigation Guidelines (English Nature 2001). These guidelines state that four survey visits are required to determine presence/absence of great crested newts and that a further two visits (a total of six visits) are required if great crested newts are present, in order to ascertain an estimate of the population size in each pond. The locations of water bodies that were surveyed on and adjacent to the site are shown on Figure 2.

2.1.2 Access to some of the waterbodies identified for survey was restricted in 2005 and this prevented full presence/absence surveys from being conducted in those locations at that time. For this reason some ponds were re-surveyed. Notes and additional limitations of the survey are detailed in Appendix A.

2.1.3 A minimum of three of the following survey techniques was employed at each pond:

- **Egg searching:** accessible emergent aquatic vegetation was searched for the eggs of all newt species. In the absence of suitable emergent vegetation, submerged leaves from bank side vegetation and litter were examined.
- **Torchlight search:** all ponds that contained water were searched by torchlight (using a Clubman CB2 with a 50W xenon spot bulb) after dusk. The perimeter was walked (where accessible) and all marginal vegetation and pond edges were searched for newts where visibility allowed. No torchlight searches took place if the air temperature was below 5ºc, in windy conditions or if it was raining.
- **Bottle trapping:** bottle traps of a standard design, based on 2L drinks bottles, were placed in marginal vegetation in the accessible areas of the pond. The traps were set during the early evening of the first day on site, checked and emptied if necessary during the torchlight survey and then checked and removed by 8am the following morning. Each bottle had a pocket of air trapped in it to address animal welfare issues. All traps were counted back in at the end of the survey to ensure that no traps were left behind. The traps were set at a density of one trap per metre around all accessible areas of bank.
- **Terrestrial search:** searches of land adjacent to potential breeding ponds were carried out where possible. This involved the lifting of natural refugia such as logs, stones and pieces of plastic or card where they were found with the aim of recording any amphibians which might be sheltering under these objects.

- **Netting:** a dip net was swept across the pond to catch any newts within reach of the pond perimeter.

2.2 TIMING

2.2.1 All surveys were carried out between 22nd March and 23rd June, 2005 and between 4th April to 11th June 2006. At least two surveys were carried out between mid-April and mid-May in each of the ponds for which full access was achieved, thus meeting recommendations made by English Nature for a presence/absence survey (English Nature, 2001).

2.3 WEATHER CONDITIONS

2.3.1 Prevailing weather conditions were checked before each survey. Surveys were not undertaken when evening temperature was predicted to be below 5ºc, when there were strong winds or when heavy rainfall was predicted as these weather conditions would significantly reduce the activity of newts or visibility through the surface of the water during torchlight searches. Also, if the weather was predicted to be hot and sunny, traps were set later in the evening, and collected early the following morning, to minimise the chances of air in the traps being exhausted.

Personnel

All procedures were undertaken by an appropriate great crested newt conservation licence holder.

Hayden Torr – English Nature GCN licence number 20061389
Stuart Ireland - English Nature GCN licence number 20051112
Eleanor Weir - English Nature GCN licence number 20052672
Cate McIvor – Assistant working under supervision of Eleanor Weir
Rhian Leigh – English Nature GCN licence number 20042687
Hannah Price – English Nature GCN licence number 20042217

3 Results

3.1 WEATHER CONDITIONS

3.1.1 The weather conditions for the surveys are listed in table 1. All surveys were undertaken in suitable weather conditions and at the correct time of year.

Table 1: Weather Conditions during surveys

Date	Air Temperature (◦C)	Weather conditions
23/03/05 – 24/03/05	10	Dry
13/04/05 – 14/04/05	8	Dry
20/04/05 – 21/04/05	7-8	Dry
04/05/05 – 05/05/05	8	Dry
22/06/05 – 23/06/05	12	Dry
04/04/06 – 05/04/06	6	Dry
05/04/06 – 06/04/06	6	Dry
08/05/06 – 09/050/06	12	Dry
09/05/06 – 10/05/06	16	Dry
10/05/06 – 11/05/06	12	Dry
11/05/06 – 12/05/06	13	Dry
15/05/06 – 16/05/06	12	Dry
16/05/06 – 17/05/06	12	Dry
11/06/06	19	Dry

3.2 SURVEY RESULTS

3.2.1 Table 2 (below) summarises the results of the surveys undertaken on the site. All raw data, including site conditions, weather, temperatures and all animal counts are recorded in Appendix B.

3.2.2 Great crested newts were recorded using the bottle trapping and torching techniques and egg searches. Terrestrial searches were made at each accessible site but no positive evidence of great crested newts was found at any of the ponds through this survey technique.

Ponds in which great crested newts are present:

3.2.3 Great crested newts were confirmed to be present within four of the water bodies surveyed (Ponds 4, 6, 7and 10 on Figure 2). Six repeat surveys were conducted on each of these ponds in order to ascertain the estimated population size.

3.2.4 Based on the guidance within the great crested newt mitigation guidelines (EN, 2001), the estimated population sizes at each pond are as follows:

Pond 4 - Small population

Pond 6 - Small population

Pond 7 - Medium population

Pond 10 - Small population

Ponds in which great crested newts are absent:

3.2.5 The results of full presence/absence surveys (comprising four repeat surveys) of ponds 3, 9, 13 and 14 showed that great crested newts are absent from these four ponds.

3.2.6 A further four water bodies (ditches) were considered to be unsuitable for breeding great crested newts as they either contained steadily flowing water or were completely dry. These water bodies (labelled 1, 2, 11 and 12 on Figure 2) were therefore not surveyed.

Ponds for which no survey information is available:

3.2.7 Two of the ponds (Pond 5 and 8) identified for survey were not surveyed due to access restrictions in both 2005 and 2006. These ponds are within privately owned land that is outside of the application boundary.

3.2.8 Two further ponds (15 and 16) were not identified until after the 2006 great crested newt surveys had been completed. This was because a) the ponds are not marked on OS maps of the area and b) phase 1 habitat surveys of this area were undertaken in late June, which is too late in the year to undertake newt surveys to the best practice guidelines. Brief descriptions of these two ponds have been included within table 2.

Table 2: Survey Results (see also Figure 2)

Pond Number	Pond description	Survey Result	Summary
1	Open field drainage ditch with grassy sloped banks and shallow running water.	Not suitable and not sufficient water for bottle traps. This area was torched on four occasions and no newts were recorded.	Not suitable
2	Dry depression indicating historic location of pond. Pond and stretch of stream either side has been dry for a number of years. Not suitable for breeding newts.	Completely dry, not suitable for great crested newts. Terrestrial search undertaken on one occasion and no newts were identified.	Not suitable
3	Field pond with shallow banks and well established, with nearly all the perimeter supporting aquatic vegetation including rushes, bulrush, common reed and marsh marigold. There is a small island supporting goat willow and weeping willow. Canada Geese and moorhen with young were present at the pond. The pond is surrounded by improved grassland to the north, west and south and the tree-lined wet ditch runs along the eastern side. This pond provides suitable amphibian habitat and suitable terrestrial habitat for newt species exists within the trees present to the north and east of the pond.	Contains populations of smooth and palmate newts (highest counts 38 and 6 respectively, using bottle traps). Great crested newts assumed to be absent from this pond on the basis of the results of the full presence/absence survey.	GCN absent
4	Woodland pond, 50% tree shade, 40% emergent vegetation present. Very nutrient-rich which caused low visibility during torching. Very shallow with debris on surface. Approximately 40m perimeter and 30% torchable (to a maximum depth of 10cms).	Great crested newts confirmed to be present in this pond. Highest count was 4 using bottle traps. Smooth and palmate newts also present.	GCN Present
5	No access possible to this waterbody. Therefore not know if pond is suitable for newts.	Not surveyed	Not surveyed
6	Margins dominated by *Typha* sp. Contained large amounts of submerged vegetation (dominated by Water mint *Mentha aquatica*). Shallow sloping sides. Water level dropped considerably within the survey period causing many GCN eggs to dry out. Surrounded by species-rich, marshy grassland and tall ruderals. Shaded in early morning by surrounding scrub. Approximately 20m perimeter.	GCN recorded in this pond. Highest count was 6 using bottle traps. Eggs were also found on vegetation. Smooth and palmate newts were also found here.	GCN present. Breeding pond.

Pond	Pond description	Survey Result	Summary
7	Margins dominated by *Typha* sp. of 4m width. Small area in middle with submerged, floating vegetation. Large amounts of Water Mint (*Mentha aquatica*). As for Pond 6, water level dropped considerably within the survey period causing many GCN eggs to dry out. Surrounded by species-rich, marshy grassland and tall ruderals. Approximately 30m perimeter.	Highest count was 30 GCN recorded from this pond using bottle traps. GCN eggs were observed on almost every Water mint plant. GCN also observed laying eggs. Palmate and smooth newts also recorded here using bottle traps and torchlight.	GCN present. Breeding pond.
8	Access was not possible although the pond was appraised from a distance and is considered to be suitable for newts.	Not surveyed	Not surveyed
9	Very shallow pond (maximum 15cms), heavily shaded, likely to be ephemeral. Some emergent vegetation and dead leaves at bottom. Surrounded by trees and scrub and a golf course. Approximately 35m perimeter.	No Great crested newts recorded in this pond. Small numbers of smooth and palmate were recorded.	GCN absent
10	Shallow pond shaded by willows. Garden waste dumped (grass etc) causing stagnant water. 10% emergent vegetation. Very difficult to torch (20%) due to dead leaves and catkins on surface, nutrient-rich water and oily film on surface. Population count likely to be an under-estimate. Approximately 20m perimeter.	Highest count was 4 Great crested newts recorded in one survey session using bottle traps. GCN eggs also found. Smooth and palmate newts were present here.	GCN Present. Breeding pond.
11	Stream, not surveyed as unsuitable for newts (due to running water).	Not surveyed	Not suitable
12	Stream, not surveyed as unsuitable for newts (due to running water).	Not surveyed	Not suitable
13	Small, deep (>2m) pond, below motorway embankment so likely to contain run-off from motorway. Adjacent to arable field. Approximately 8m perimeter.	No Great crested newts recorded. 6 Smooth newts were recorded using bottle traps in one survey session.	GCN absent
14	Relatively new, unshaded pond, created in Autumn 2004. Had a liner so bottle trapping was not feasible. Had shallow sides but sloped down to about 6ft deep in the middle where there was some pond weed. Little other emergent/submerged vegetation available for egg-laying or avoidance of predators. Many fish of varying size and regularly visited by heron. Surrounded by uncut grass and arable field.	A maximum of 1 Palmate and 2 Smooth newts were recorded in this pond.	GCN absent

Pond	Pond description	Survey Result	Summary
15	A small field pond that is partially silted up. The pond has natural banks and marginal vegetation is present, including abundant bulrush (*Typha latifolia*).	Not surveyed	Not surveyed
16	An ornamental garden pond with sloping banks of rubble and large rocks. This pond contains marginal vegetation of rushes (*Juncus sp*.), bulrush (*Typha latifolia*), willowherbs (*Epilobium sp*.) and willow (*Salix sp*.). One adult male smooth newt (*Triturus vulgaris*) was observed during the field survey (June 06) and several possible newt larvae or juvenile fish were also observed. A full survey of the pond was not undertaken as the pond was discovered too late in the year to undertake newt surveys to best practice guidelines. (I.e. absence of great crested newts could not have been proven).	Not surveyed	Not surveyed

4 Interpretation and Evaluation

4.1 INTERPRETATION

4.1.1 Great crested newts rely on water bodies for breeding, but spend a large part of their lifecycle on land within rough grassland, hedgerows and woodland areas. Arable land within 100m of breeding sites is also associated with low levels of occupancy (JNCC, 1998). Great crested newts hibernate during the coldest months of the year, often within deadwood or rubble piles, or underground amongst tree roots or in mammal burrows. Both the water bodies and the terrestrial habitats used by great crested newts are protected under UK and European law.

4.1.2 Great crested newts are present within ponds 4, 6, 7 and 10 and are likely to be breeding in all of these water bodies. It should therefore be assumed that great crested newts are present within the suitable terrestrial habitat that is adjacent to these ponds and which falls within the development site (grassland, hedge bases, scrub, ditches and woodland).

4.1.3 Great crested newts often form metapopulations, i.e. a series of sub-populations that are linked by the dispersal of individuals. They can move over large distances (up to 1.3km) and are considered to move regularly over suitable terrestrial habitat within a radius of 500m from their breeding ponds (English Nature, 2001). Several of the waterbodies marked on Figure 2 are within 500m from each other and dispersal of individuals between any of the ponds may occur along corridors of suitable terrestrial habitat within the site boundaries.

4.2 FURTHER SURVEY RECOMMENDATIONS

4.2.1 Four ponds identified within 500m of the site boundary have not been surveyed. These are ponds numbered 5, 8, 15 and 16. Survey was not possible due to access restrictions or discovery of ponds after the appropriate survey season. Ideally these ponds would be surveyed prior to any application for planning permission. However, should this not be possible, a precautionary principle should be adopted and great crested newts should be assumed to be present in these four ponds. This is likely to be the case at pond five in particular, due to the known presence of great crested newts at close proximity in pond 4. Similarly, the record of a smooth newt from pond 16 during a Phase 1 Habitat survey in June demonstrates the suitability of this pond for amphibian species (and therefore great crested newts).

4.3 MITIGATION RECOMMENDATIONS

4.3.1 Due to the presence of great crested newts within water bodies directly adjacent to the site, and the likelihood that these populations utilise terrestrial habitat within the site boundaries, it would be necessary to exclude the newts from the site prior to development to avoid contravention of the relevant legislation (the Wildlife and Countryside Act, 1981 and the Habitat Regulations, 1994).

4.3.2 Natural England should be consulted at the earliest opportunity to discuss principles of mitigation for great crested newts and the techniques available for this development site in the context of the proposals. Other protected species, notably reptiles, should be considered at the same time as great crested newts so that complementary and appropriate mitigation measures can be put in place where necessary (see WSPE, 2005 for a discussion of protected species present on the site).

Construction Phase Mitigation

4.3.3 In order to prevent accidental killing or injury of this protected species, it is recommended that great crested newts be excluded from the development site prior to the start of works and that the mitigation measures required should be designed in consultation with Natural England (this is most likely to involve the use of a combination of exclusion and drift fencing and pitfall trapping to capture and remove newts from the development footprint, and the provision of a temporary or permanent receptor site). The density and exact location of the fencing and traps would be based upon a combination of the findings of this survey and on the final scheme design and phasing. For example, it may be desirable to subdivide the development site to allow for the removal of newts from areas of the site in phases. It is possible to capture newts by this method throughout most of the frost-free moths of the year (EN, 2001).

4.3.4 In accordance with best practice guidance (HGBI, 1998), the minimum trapping effort would be 60 nights on which weather conditions are suitable and the density of pitfall traps should be 80 per ha, each with 10m of drift fencing. These figures are calculated on the basis of the presence of a medium population of newts, as found within pond 7. It may be possible to undertake a lower trapping effort in areas of the site for which only low populations of newts have been recorded.

4.3.5 The reasonable end point can be assumed to have been reached when newt trapping in warm (5^{o}C or more) and rainy weather is producing no more than one newt per ha per day. In general the aim should be to catch at least 95% of the known or estimated numbers of newts.

4.3.6 A European Protected Species (EPS) licence would be required for the proposed development of this area, and should be obtained from Natural England well in advance of the onset of development works. It is usually not possible to obtain an EPS licence before the receipt of planning permission. A Method Statement detailing the planned mitigation works would be required to accompany the EPS licence application.

Operational Phase Mitigation

4.3.7 Once development is completed it would be possible to incorporate the newts within parts of the scheme such as the retained woodland at Crismill Shaw and WSPE recommend that special measures be considered to enable the natural movement of the newts from breeding ponds to suitable terrestrial habitat. Habitat creation and the retention or creation of links into the wider countryside for use by newts would ensure the long term viability of the newt population in the area and it is recommended that a description of such measures are included in any application for an EPS licence. In farmland, research has indicated that a mosaic of woodland or scrub totalling 5 ha in every 75 ha of land is sufficient for persistence of populations of great crested newts (JNCC, 1998) and it is recommended that this figure is used as a guide to habitat creation efforts.

4.3.8 If the relevant land owners are agreeable, the water bodies adjacent to the site boundary could be enhanced for the benefit of existing great crested newt populations. For example, the pond at 4 (Figure 2) could be deepened to ensure that it does not dry up during the summer, thereby providing a more reliable breeding pond for the species.

4.3.9 The dried up ponds indicated at letter A and number 2 on figure 2 does not fall within the current development envelope and present an opportunity for habitat creation. It is recommended that wildlife ponds are created in these areas and that requirements of great crested newts are considered within the design of these ponds.

4.3.10 Additional habitat creation should also be undertaken along the north-western margins of the development and this should include measures for newts, specifically through the provision of good terrestrial habitat for the newt populations known to be present within the ponds to the west of the development boundary.

4.3.11 Where site operations are deemed to present a continued risk to newts, permanent newt fencing should be considered in order that newts are not able to access the operational part of the development. To maximise the conservation benefits for great crested newt this should be installed immediately adjacent to the boundary of the operational area, to allow a maximum amount of land to be available for re-colonisation by the newts.

5 Conclusion

5.1.1 Great crested newts are present within four waterbodies adjacent to the development boundary and it is therefore highly likely that great crested newts are present within suitable terrestrial habitat within the development site (grassland, hedge bases, scrub, ditches and woodland). Population estimates for the site show that there are low populations of great crested newts within three of the ponds and a moderate population of great crested newt within one pond.

5.1.2 It will be necessary to obtain a European Protect Species licence in respect of great crested newts prior to the start of the proposed development. It is recommended that the four ponds for which survey data is not available (5, 8, 15, 16) are surveyed in order to properly inform the licence application.

5.1.3 It is recommended that great crested newts be excluded from the development site to ensure works do not contravene legislation and this is most likely to involve the use of a combination of fencing and pitfall trapping; the trapping effort required would be determined by the findings of further population surveys.

5.1.4 Once development is complete it should be possible to incorporate the newts within parts of the scheme where suitable terrestrial habitat has been retained or created and habitat enhancement measures for great crested newts are also recommended.

5.1.5 Where site operations are deemed to present a continued risk to newts, it is recommended that permanent newt fencing be considered, in order that newts are not able to access the operational part of the development and to allow a maximum amount of land to be available for re-colonisation by newts.

WSP Environmental Ltd.

References

English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

HMSO Wildlife and Countryside Act 1981

HMSO Conservation (Natural Habitats & c.) Regulations 1994

HMSO Countryside and Rights of Way Act 2000

JNCC (1998) Herpetofauna Worker's Manual

Kent and Medway Biological Records Centre (2005) Report Regarding Hollingbourne, Maidstone (in Appendix B, WSPE Extended Phase 1 Habitat Survey).

WSP Environmental Ltd (2005) Hollingbourne Business Park Extended Phase 1 Habitat Survey

Figure 1 Site Location Plan

PROJECT:			DRAWING STATUS:	
HOLLINGBOURNE BUSINESS PARK			FINAL	
DATE: August 2005 BY: KAM CHECKED: AB		PROJECT No: 12070549/001	DRAWING NO: FIGURE 1	REV: -
TITLE: SITE LOCATION PLAN				

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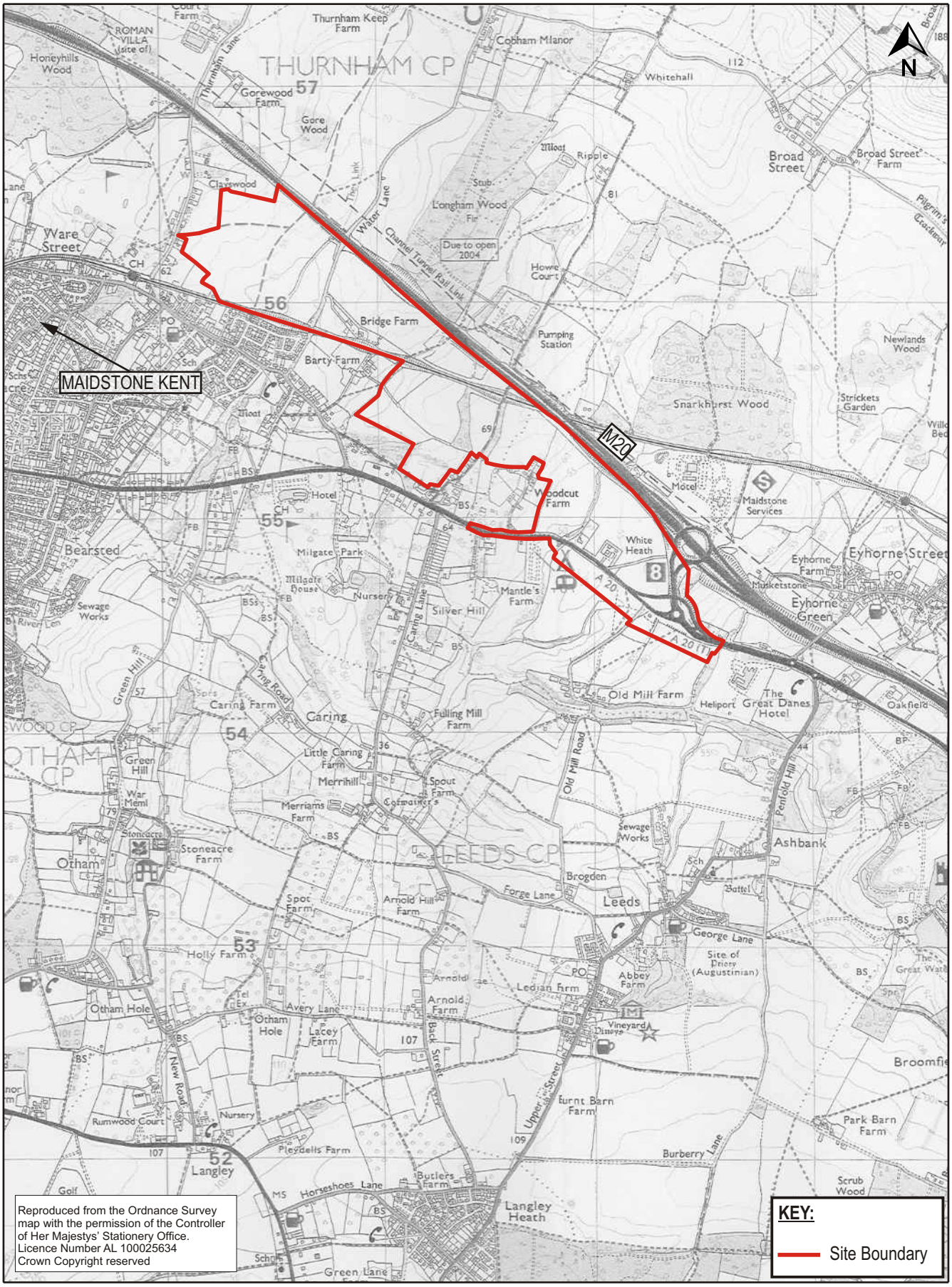

Figure 2 Location of Waterbodies

KEY:

1. Waterbody reference number
- Dry pond presentIng an opportunIty for habItat creatIon
- Survey not undertaken
- Great crested newts found to be absent
- Great crested newts found to be present
- Not suitable for Great crested newts

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: FINAL

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CLIENT: Kent International Gateway Ltd.

PROJECT: Kent International Gateway

TITLE: Waterbodies

SCALE @ A3:	CHECKED:	APPROVED:
1:6500	AB	AB
CAD FILE:	DESIGN-DRAWN: KAM	DATE: DECEMBER 2006
PROJECT No: 12070549	DRAWING No: Figure 2	REV: -

Appendix B Raw Survey Data

Surveys undertaken 2005

Temp	Visit 1 10°C Dry		Visit 2 8°C Dry		Visit 3 7-8°C Dry		Visit 4 8°C Dry		Visit 5 12°C Dry	
Pond	23/03/05 – 24/03/05		13/04/05 – 14/04/05		20/04/05 – 21/04/05		04/05/05 – 05/05/05		22/06/05 – 23/06/05	
	Torching	Bottles	Torching	Bottles	Torching	Bottles	Torching	Bottles	Torching	Bottles
1	Not surveyed		0	No bottles	0	No bottles	0	No bottles		
2	Not surveyed		Not surveyed		Not surveyed		Not surveyed			
3	Not surveyed		8 M S 15 F S 3 UNID S/P *	22M S 8 S 4M P 1F P	10M S 2M P 16F S/P 9 UNID S/P	38M S 30F S 3M P 3F P	Not surveyed	18M S 5F S 1F P	Nothing in torchlight	1 MS 6 FS 1 ESK
4	Not surveyed		5M S 5F S 4M P 1F P 2 UNID S/P Possible GCN	2M GCN 8M S 6F S 3M P 2F P	1M GCN 8M S 6F S 1M P 3 UNID S/P	6M S 2M P 2F P	4M S 4F S 1M P 6 UNID S/P	3M GCN 5M S 1F S 1M P 1F P	Nothing in torchlight	No water for bottle traps
5	Not surveyed		Not surveyed		Not surveyed		Not surveyed		Not surveyed	
6	4M GCN 2F GCN 6M S 1M S 4UNID S/P	1M S 5F S	Not surveyed		Not surveyed		Not surveyed		Not surveyed	
7	4M GCN 2F GCN 1F S	15M GCN 3F GCN 1M P 1F P	Not surveyed		Not surveyed		Not surveyed		Not surveyed	
8	Not surveyed		Not surveyed		Not surveyed		Not surveyed		Not surveyed	
9	4 frogs	No bottles	Not surveyed		Not surveyed		Not surveyed		Not surveyed	
10	2M S 1F S 1UNID S/P	3M P 1F P	Not surveyed		Not surveyed		Not surveyed		Not surveyed	

Surveys undertaken 2006

Temp	6°C Dry				6°C Dry				12°C Dry				16°C Dry			
Pond	Visit 1	04/04/06 – 05/04/06			Visit 2	05/04/06 – 06/04/06			Visit 3	08/05/06 – 09/050/06			Visit 4	09/05/06 – 10/05/06		
	Torching	Bottles	Egg	Net	Torching	Bottles	Egg	Net	Torching	Bottles	Egg	Net	Torching	Bottles	Egg	Net
4	1Sm	-	0	1GCNf 1Sf 1Sm	1Sm	-	0	3Sf 1Sm	Survey not done				2Pm 1Pf	2GCNf 2GCNm 5Sf 12Sm 2Pm	-	1Sm
6	Survey not done				1GCNm 2Sf 1Pf	-	0	1Sf	Survey not done				1GCN 6Sf 1Sm	4GCNm 2GCNf 3Sm 1Sf		1Sm
7	Survey not done				4GCNm 1GCNf 14Sm 12Sf 4Pm	-	GCN	14Sm 3Sf 2Pm 1Pf 1GCNm	Survey not done				6GCNf 6GCNm	15GCNm 15GCNf 1Pm 4Sm	Almost all mint had GCN eggs on	-
9	1Sm 1S/Pf	-	0	0	0	-	0	0	1Sm	0	-	0	1Sf	1Sm	-	0
10	1GCNf 1GCNm 1Sm	-	0	0	1GCNf 1SJs 1UID	-	0	0	1Sf	1Sm	-	0	1GCN(?f)	1Pf	0	-
13	1Sm	-	0	0	0	0	-	0	Survey not done				0	6Sm	-	0
14	Survey not done				Survey not done				Survey not done				Survey not done			

Temp	12°C Dry				13°C Dry				12°C Dry				12C Dry			
Pond	Visit 5	10/05/06 – 11/05/06			Visit 6	11/05/06 – 12/05/06			Visit 7	15/05/06 – 16/05/06			Visit 8	16/05/06 – 17/05/06		
	Torching	Bottles	Egg	Net	Torching	Bottles	Egg	Net	Torching	Bottles	Egg	Net	Torching	Bottles	Egg	Net
4	Survey not done				0	4Sf 3Sm 2Pm 1Pf	-	-	1Sm	1GCNf 4Sm 2Sf 1Pf	-	-	2Sm	3Sf 1Sm 1Pf	-	-
6	2 GCNf 1S/Pf 2Sm	1GCNf 1GCNm 7Sm 2Sf	GCN	-	2GCNm 1GCNf 1Sf	2GCNm 1GCNf	GCN	-	3GCNf	2GCNm	-	-	2GCNf 1GCN(Unid) 1Sm	2Sf 1Sm 1GCNm 1GCNf		
7	5GCNm 5GCNf	7GCNf 3GCNm 2Sm	-	-	10GCNm 6GCNf 2Sm 1S/Pf	5GCNm 7GCNf 2Sm 1Pm	-	-		3GCf 1GCNm 4Sm 1Sf 1Pm			2GCNm 2Sm 3S/Pf 1Grass snake	7GCNm 5Sm 1Pf 1Pm		
9	Survey not done				Survey not done				Survey not done				Survey not done			
10	Survey not done				1Pm	1GCNm 1Pm	-	-	2GCNf 1GCNm 1Sm 2S/Pf	4GCNf 1GCNm	GCN	-	Survey not done			
13	0	1Sm 1Sf	-	0	Survey not done				Survey not done				Survey not done			
14	Survey not done				0	-	-	-	1Pf	-	-	0	1Sf 1Sm (3 Sm on 11/06/06)	-	0	0

Key: S – Smooth newt
P – Palmate newt
GCN – Great crested newt
M – Male
F – Female