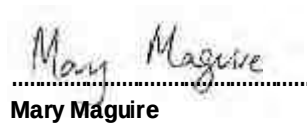
TYRONE CAVAN INTERCONNECTOR BAT REPORT 2015

SONI

February 2016

Prepared by:		**Checked by:**	
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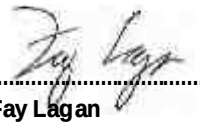
Approved by:			
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Tyrone Cavan Interconnector Bat Report

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1	Finalised draft	ELB	FL	Feb 2016

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1 Introduction

AECOM was commissioned by SONI, in July 2015, to conduct bat activity and emergence re-entry surveys in accordance with the Bat Conservation Trust's Bat Survey: Good Practice Guidelines (Hundt, 2012) at the site of the proposed Tyrone Cavan Interconnector (herein referred to as the Proposed Development). The purpose of the survey was to update the bat surveys which had already been completed and reported on in 2013 (AECOM, 2013).

Bat surveys have previously been carried out on the site during 2009, 2010, 2011, 2012 and 2013.

The area of the Proposed Development comprises mainly improved grassland, poor semi improved grassland, and arable fields. The field boundaries associated with the Proposed Development are species poor hedgerows and hedgerows with trees.

1.1 The Proposed Development

The Proposed Development forms the Northern Ireland element of the The North-South 400 kV Interconnection Development:, which is being jointly promoted by SONI and EirGrid, forming part of a major cross-border development to improve interconnection between the NIE transmission system in Northern Ireland and the ESB transmission system in the Republic of Ireland.

The Proposed Development includes:

- **The construction and operation of a new 275kV / 400kV (source) substation at Turleenan townland, north-east of Moy, County Tyrone;**
- **The construction and operation of two 275kV terminal towers to enable connection of the Turleenan substation to NIE's existing 275kV overhead line and the removal of one existing 275kV tower;**
- **The construction and operation of a single circuit 400kV overhead transmission line supported by 102 towers for a distance of 34.1km from the source substation (at Turleenan) to the border where it will tie into the future ESB network; and**
- **Associated Works to include site levelling, site preparation works, modification of existing access points, construction of new access points, construction of new access lanes, construction of working areas, stringing areas, guarding, site boundary fencing and related mitigation works. Formation of access tracks and other associated works at the substation and at the tower locations.**

The overhead line will run from the townland of Turleenan (near Moy), County Tyrone for a distance of approximately 34km to the Republic of Ireland border, crossing at a position between the townlands of Doohat or Crossreagh, County Armagh, and Lemgare, County Monaghan with a 200m oversail section in the Northern Ireland townland of Crossbane.

Each tower base will be installed within a 35m X 35m working area, however the working area will be returned to its original use (excluding the immediate area around the tower base) once construction of the towers is complete.

The Proposed Development will also result in the permanent removal of 842m of hedgerows (including 630 trees) and trimming of trees and hedgerows. This is to facilitate the installation of the 400kV line on the towers and connect it to the substation.

The tower bases will be accessed using routes which, in the majority of cases follow existing farm lanes. These farm lanes and tracks are often bounded by tree lines and hedgerows which will be retained.

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1.2 Aim of Survey

The overall aim of the 2015 survey was to produce up to date data and ensure seasonal variations are adequately reported. Bat surveys were completed throughout the season in 2015. There is a large amount of data already published relating to bat activity on and around the site of the Proposed Development. The report hypothesis is that the 2013 data still provides an accurate representation of bat usage. This hypothesis will be tested by comparison between the 2013 and 2015 data collected.

1.3 Legislation

All of Northern Ireland's bat species are Northern Ireland Priority Species and Species of Conservation Concern. Bats are European Protected Species, protected under the Conservation (Natural Habitats) Regulations (Northern Ireland) 1995 (as amended). These Regulations are informally referred to as the Habitats Regulations. These Regulations formally transpose the European Union Habitat and Species Directive 1992 (EC Directive 92/43/EEC) into national law. Amendments to the Habitat Regulations (2011)[1] have given additional protection to linear features, such as hedgerows and streams, because of the importance of these features for bats. The protection of these features prevents the degradation of roosts caused through the severance of links between roosts and the wider environment, particularly foraging habitat.

It is an offence to:

- **Deliberately capture, injure or kill any bat;**
- **Deliberately disturb bats, in particular where it is likely to:**
    - **Impair their ability to breed or reproduce, or to rear or nurture their young;**
    - **Impair their ability to hibernate or migrate; or**
    - **Affect significantly the local distribution or abundance of bats.**
- **Intentionally or recklessly damage, destroy or obstruct the access to the place of shelter - or protection; and,**
- **Damage or destroy a bats breeding site or resting place.**

Consequently, attention should be given to designing full mitigation measures in order to compensate for the modification or development of an area if aspects of it are deemed important for bats, such as roosts, flight corridors and foraging areas.

1.4 Quality Assurance

This project has been completed in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, its quality as well as covering all aspects of environmental and Health and Safety management. All staff members are committed to establishing and maintaining our accreditation to the relevant international standards namely BS EN ISO 9001:2008 and14001:2004 and BS OHSAS 18001:2007. In addition, our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

[1] **The Conservation (Natural Habitats, etc) (Amendment) Regulations (Northern Ireland) 2011**

2 Methodology

The survey was comprised three parts:

- **Review of existing information (including reports and associated data from surveys conducted during 2009, 2010, 2011, 2012 and 2013 (AECOM, 2012 and 2013);**
- **Bat emergence and re-entry surveys at dusk / dawn to assess the usage of bat roosts which had previously been identified; and,**
- **Bat activity surveys to assess bat activity across the site, to compare with previous surveys.**

2.1 Review of Existing Data

All previous reports from bat surveys conducted for the Proposed Development were reviewed and summarised. As part of the review of existing information, an inter year survey summary was also conducted. This exercise summarised the amount of survey effort for each tower location. In addition to summarising the amount of survey at each tower location, it was identified if a linear feature would be disrupted as a result of the proposed development. This activity was conducted to ensure that all towers and the substation had been subjected to robust survey.

2.2 Emergence and Re-entry Surveys

2.2.1 Introduction

Emergence and re-entry surveys were carried out on buildings and trees which had been identified as roosts during previous surveys. Roosts had previously been identified in the proposed substation site (located in a tree line and within a tin roofed shed), and one roost had previously been recorded in a tree line to the east of proposed Tower 60 (T60).

2.2.2 Emergence Surveys

Two emergence surveys were carried out in July 2015. One survey was carried out at a treeline located in the south-western area of the proposed substation site, and one survey was carried out at the tin roofed shed, also within the substation site. In September 2015, three emergence surveys were completed. One survey was conducted on the aforementioned substation tree line, the second September survey was conducted on the tin roofed shed and the third September emergence survey was carried out on the tree line to the east of proposed T60.

The surveys commenced between 15 to 30 minutes prior to sunset and continued for at least 2 hours after sunset. Any bats emerging from trees/structure were recorded as were the number of bats and passes heard/seen during the survey. Survey equipment used is listed in Section 2.6.

The survey dates and locations are detailed in Table 1. In accordance with 2012 Bat Conservation Trust's Bat Survey: Good Practice Guidelines (Hundt, 2012) the weather conditions for each survey were recorded. Surveys were not completed when conditions were considered sub optimal. Weather conditions for each survey are presented in Appendix A.

Data collected from the surveys were analysed to species level, where possible, using BatSound and Batscan sound analysis software.

2.2.3 Re-entry Surveys

In July 2015, a re-entry survey of the treeline located in the south-western area of the substation site was carried out, and a re-entry survey was carried out at the tin roofed shed within the proposed substation site.

In September 2015, one re-entry survey was completed on the tree line in the substation site. One re-entry survey was completed on the tin roofed shed in the substation site and a re-entry survey was completed on the tree line to the east of proposed T60.

The re-entry surveys commenced two hours before sunrise and were completed at sunrise. The number of bats and passes and swarming behaviour was recorded and any bats entering the trees/structure were also recorded. Survey equipment used is listed in Section 2.6.

The survey dates and locations are detailed in Table 1. In accordance with Bat Conservation Trust's Bat Survey: Good Practice Guidelines (Hundt, 2012) the weather conditions for each survey were recorded. Surveys were not completed when conditions were considered suboptimal. Weather conditions for each survey are given in Appendix A.

Data collected from the surveys were analysed to species level, where possible, using BatSound and Batscan sound analysis software.

2.3 Bat Activity Surveys

In July and September 2015, a series of 24 walked transects (48 km combined length) were carried out. The transects included proposed tower and stringing locations, and proposed access tracks. The purpose of the 2015 surveys was to corroborate the results recorded in 2013. The 2013 transects followed those originally walked in 2009, and for consistency with the previous surveys the same transect routes were used in 2015. However, these could not all be walked using the same route because of various site limitation (Section 2.7.1 – General Survey Limitations).

Surveys took account of the Bat Conservation Trust's Bat Survey: Good Practice Guidelines (Hundt, 2012). Each walked transect was completed by a surveyor using a heterodyne bat detector with frequency division or time expansion recording functions so that all bat numbers and bat passes were listened to in the field and also recorded for subsequent analysis. A list of equipment used is presented in Section 2.6.

Each transect was walked at a constant speed along a pre-determined route (where permitted) with regular listening points. The listening points were located along the route of the Proposed Development where it crosses a linear feature or in locations where the route of the Proposed Development runs adjacent to a linear feature. Where deviations from the route took place, there were marked on the map and reasons for deviation was given.

During the surveys, each surveyor recorded the number of estimated bats and bat passes. The number of bats relates to the individuals observed, passes by the same bat were not double counted. Bat activity was recorded for at least 3 minutes at each listening point, as well as continuously between each of the listening points.

The data collected was used to provide an index of bat activity along each transect and thus along the overhead line route. This was the method used to assess usage in the 2013 report and has been repeated in this report, for consistency and robustness. Surveys commenced 15 to 30 minutes before sunset and continued for at least 2 hours after sunset. Surveys were carried out during suitable weather conditions. Table 1 provides the survey dates for the 2015 surveys. The surveyed area included the footprint of the proposed substation and 26 of the 102 proposed tower locations. These areas were surveyed twice. The remaining 76 proposed tower locations could not be surveyed either because land access was not permitted or there were Health and Safety risks associated with livestock in the fields.

Data collected from the transect surveys were analysed to species level, where possible, using BatSound and Batscan sound analysis software.

2.4 Dates and Locations of Surveys

Table 1 provides the survey dates, locations and survey types for the 2015 surveys.

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Table 1: Dates, locations and survey types completed in 2015

Date	Dusk Activity Survey / Tower Location Area	Exit Survey / Location	Re-entry Survey /Location
July 2015			
22th July 2015	Substation, T1-T2, T3-T4, T8-T10, T12-T13		
24th July 2015	T62-T63, T61, T64-T65		
25th July 2015	T59-T60		
29th July 2015	T49-T51, T48, T20, T23-T25		
30th July 2015		At tree line and tin roofed shed on substation site	
31st July 2015			At trees on line and tin roofed shed on substation site At tin roofed shed on substation site
September 2015			
9th September 2015	Substation, T1-T2, T3-T4,		
14th September 2015	T60 –T61, T62-T63, T64-T65		
15th September 2015	T49-T52, T48, T59-T60		
16th September 2015	T8-T9, T12-T13, T20, T23		
23rd September 2015		At tree line and tin roofed shed on substation site	
24th September 2015			At tree line and tin roofed shed on substation site
24th September 2015		Tree line at T60	
25th September 2015			Tree line at T60
28th September 2015	T23-T25		

2.5 Surveyor Information

Table 2 details the experience of the surveyors deployed on the Site in 2015. The survey was led by Mary Maguire, one of the original survey designers and surveyors in 2009, and leader of the 2013 survey effort.

Table 2: Surveyor details

Surveyor Name	Relevant Experience
Mary Maguire	10 years' experience in bat surveys.
Eleanor Ballard	8 years' experience in bat surveys.

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Surveyor Name	Relevant Experience
Paul Lynas	8 years' experience in bat surveys.
Jennifer Jones	3 years' experience in bat surveys.
Conor Reid	3 years' experience in bat surveys.
Joe Martin	5 years' experience in bat surveys.
Gaia Aplington	2 years' of experience in bat surveys.

2.6 Survey Equipment

The following equipment was used:

- Roland R-05 Recorders;
- Zoom H2 recorder;
- Pettersson D-240X bat detectors; and,
- Batbox Duet bat detectors.

2.7 Limitations

2.7.1 General Survey Limitations

AECOM understands there are no underground structures (cellars, basements, access tunnels etc.) associated with the Proposed Development (i.e. to be demolished) which would have the potential to offer hibernation potential for bats.

As with any ecological survey these surveys represent a snapshot in time. Habitats can change in quality, location and extent over time as a result of natural succession/colonisation and/or human activity. Highly mobile flying species such as bats can move into and out of a structure at any time from day-to-day or season-to-season. As such, NIEA require that ecological survey data are reassessed after 12 months.

Any ecological survey represents a risk assessment in respect of 'presence / likely absence' of protected species. Proving 'likely absence' (as with proving any negative) is particularly difficult. Therefore negative results should be treated with caution, especially where other survey constraints apply, such as limited access.

For issues associated with land access and Health and Safety, the exact routes completed in 2013, could not be followed. In some cases surveyors completed the perimeter of fields which contained towers, to avoid livestock. Transects were also amended to where land access was not granted in 2015, where it had been in 2013.

In the case of some of the transects (T62-T63, T64), their proximity may have resulted in double counting.

Due to limited access a number of tower locations were not available during the 2015 surveys - these were towers T5, T6, T7, T11, T14, T16, T17, T18, T19, T21, T22, T26, T27, T28, T31, T32, T33, T35, T36, T37, T38, T39, T40, T41, T42, T44, T45, T46, T47, T53, T54, T55, T56, T57, T58, T65, T66, T67, T70, T71, T72, T73, T74, T75, T77, T78, T79, T83, T84, T85, T86, T88, T89, T90, T91, T92, T93, T94, T95, T96, T97, T98, T99, T100, T101 and T102.

Due to Health and Safety considerations (e.g. animals on site which had been identified by landowner), T29, T34, T43, T68, T69, T76, T80, T81, T82, T87 and parts of the oversail were not surveyed.

Not all towers were surveyed twice during the 2015 surveys due to Health and Safety issues.

T3 location could not be accessed on the 22 July 2015 or 10 September 2015 because of livestock in the field, however, the actual parcel containing the proposed tower was surveyed.

T10 could not be accessed on the 16 September 2015 because of livestock in the fields, however, the actual parcel containing the proposed tower was surveyed.

During the T49 – T51 transect on 29 July 2015 the surveyor's movement around the transect was slowed because of livestock in fields.

The T59-T60 survey on the 25 July 2015 was amended because of livestock in the fields to be surveyed.

The northern part of the T61 transect on 24 July 2015, was not completed because the surveyor could not get access to the field. Dense vegetation and a ditch blocked the surveyor's way.

Of the towers (outside of the substation), 28 (T10, T14, T15, T18, T20, T21, T23, T24, T28, T30, T33, T44, T48, T53, T62, T65, T68, T76 T78, T79, T80, T81, T85, T87, T88, T90, T99 and T102) will result in the removal of trees and hedges to facilitate both the installation of tower bases and as part of temporary clearance of areas around the tower bases to facilitate the 35m X 35m working area. Of these 23 tower locations, seven (T10, T20, T23, T24, T48, T51 and T62) were surveyed in 2015. This is not considered a significant limitation because whilst activity has been identified, mitigation has also been identified to retain flightlines.

There was access to 48% of the transects surveyed in 2013.

2.7.2 Weather

Ecological surveys can be affected by the weather. Whilst every precaution is taken to survey in optimal conditions, unforeseen weather events can occur. During an emergence survey on the tree line at the substation site, the survey was stopped at 20:55, instead of 21:24 because of heavy rain. It is considered that this did not influence the validity of the survey, as the survey had been carried out for longer than the recommended period as presented in Hundt (2012).

The survey of T1 and T2 (Substation) on the 22 July 2015 was interrupted between 21:27 and 21:33 because of a rain shower.

At 23:27 on 24 July 2015, during the T62-T63 survey the temperature got colder and there was a rain shower which lasted five minutes.

During the September transect of T62-T63, there was a heavy rain shower between 20:29 and 20:35.

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3 Results

3.1 Desk Study

3.1.1 Summary 2009 / 2010

The bat surveys completed in 2009/2010 had a bespoke methodology agreed with Northern Ireland Environment Agency (NIEA). This methodology was based on the NIEA (Jan 09) Bat Survey – Specific Requirements as well as best practice from the Bat Conservation Trust, Bat Surveys – Good Practice Guidelines (2007). A number of steps were carried out to finalise the methodology and included a review of the Phase 1 Habitat Survey and a desk based assessment, which included a review of aerial photographs to identify any features likely to provide roosting, commuting, and foraging suitability for bats that may be affected by the Proposed Development.

It was agreed with NIEA that hedges unlikely to harbour bat roosts (i.e. those without mature, standard trees, monoculture hedges and those structurally modified by flailing/cutting) did not require a bat roost survey but did require the identification of bat flight lines (commuting routes) between roosts and foraging areas. The survey was conducted over two years. NIEA agreed that flight-line surveys (now referred to as Activity Surveys) could be carried out during the 2010 survey season to allow the most significant areas for roosting bats to be prioritised for survey during 2009. It must be noted that these surveys took place prior to the 2011 amendment of the Habitats Regulations, and as such, in 2009/2010, roosts were given greater importance than commuting / foraging routes.

During 2009/2010 transect surveys which concentrated on the areas surrounding the proposed tower locations and substation were carried out. The 2009/2010 surveys were carried out to assess the presence or likely absence of bats within the study area. However, because a triage approach was taken relating to the linear features surveyed, the study area was approximately 75% of the entire line route. The following species were recorded at least once during the 2009/2010 surveys:

- **Daubenton's bat *Myotis daubentonii*;**
- **Whiskered bat *Myotis mystacinus*;**
- **Natterer's bat *Myotis nattereri*;**
- **Leisler's bat *Nyctalus leisleri*;**
- **Nathusius' pipistrelle *Pipistrellus nathusii*;**
- **Common pipistrelle *Pipistrellus pipistrellus*;**
- **Soprano pipistrelle *Pipistrellus pygmaeus*; and,**
- **Brown long-eared bat *Plecotus auritus*.**

A temporary night time roost (one Leisler's bat seen emerging from a tree) was recorded 13 June 2009 at an alder *Alnus glutinosa* tree in the proposed substation site.

In total 1,888 calls were identified as bat passes during the bat activity surveys between 2009 and 2010. The species with the highest total percentage activity was common pipistrelle (27.54%). Leisler's bats were the second highest recorded bat species (23.52%). Bats of the *Pipistrellus* genus were well represented in the recordings; however bats of the *Myotis* genus were a small percentage of the overall total at just 1.27%.

In 2009, 1,005 calls were identified as bat passes during the bat activity surveys. The species with the highest percentage activity were bats of the *Pipistrellus* genus (25.67%). Daubenton's bats were the second highest recorded bat species (20.50%). In 2009, all the bat species encountered were identified and there were no unidentified bats.

In 2010, 883 calls were identified as bat passes during the bat activity surveys. The species with the highest percentage activity was common pipistrelle (39.52%). The second highest number of bats encountered in 2010 was Leisler's bat (27.75%). In 2010, no Daubenton's bats, whiskered bats, or brown long-eared bats were encountered.

3.1.2 Summary 2011

In 2011 driven transect surveys were carried out. Driven transects were conducted for following reasons:

- **To verify the results of the 2009/2010 surveys;**
- **To extend the survey area to provide an assessment of bat activity across the wider landscape surrounding the Proposed Development; and,**
- **To consider the activity of the local bat population over an additional year to allow for variation across years; and to include an additional survey methodology that considered bat activity along 70-80% of the study area over a single survey period.**

The result of the driven transects provided an overall coverage of bat activity at a regional level; it did not provide information associated with the exact location of the Proposed Development. The following species were recorded:

- **Leisler's bat;**
- **Common pipistrelle;**
- **Soprano pipistrelle; and**
- **Bats of the *Pipistrellus* genus[2].**

Driven transects concentrated on the minor road network surrounding the Proposed Development. The survey lacked the geographic precision to be able to state bat activity levels in the locations of the proposed tower bases and at adjacent linear features, but provided an integral understanding of regional activity, augmenting the previous years' surveys.

In total, 234 calls were identified as bat passes during the driven transect surveys. The species with the highest total percentage activity was bats of the *Pipistrellus* genus (34.19%). Common pipistrelles were the second highest recorded bat species (33.76%). Soprano pipistrelle represented 19.23% of the total number of bats encountered. Of the species recorded, the smallest percentage of recordings were Leisler's bat, with just 12.82% of the total bats encountered. There were no bats of the *Myotis* genus or brown long-eared bats recorded during the driven transects.

3.1.3 Summary 2012

In 2012 surveys were completed broadly following the methodology suggested in the Bat Survey-Good Practice Guidelines (Hundt, 2012) and limitations of the previous surveys (2009/2010, 2011) were addressed where possible. There were no driven transects completed in 2012 or thereafter.

Automated monitoring was carried out from May until September 2012, to capture bat calls in areas which had previously been unavailable due to land access issues.

Additionally, activity surveys were carried out following predetermined transects and listening points which incorporated the proposed tower locations and linear features such as tree lines and hedgerows.

The 2012 activity and remote detector surveys identified the following species within the survey area:

- **Common pipistrelle;**
- **Soprano pipistrelle;**
- **Nathusius' pipistrelle;**
- **Leisler's bat;**
- **Bats of the *Pipistrellus* genus;**
- **Whiskered/Brandt's bat[3] *Myotis brandtti*;**

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[2]The term "*bat of the Pipistrellus genus*" was used in cases where a pipistrelle bat was seen and not heard, or where the bat recorded had a peak frequency of between 48kHz and 52kHz, thereby not providing enough evidence that the pipistrelle was common or soprano.

[3]Brandt's bats are not resident in Ireland but their calls are very similar to whiskered bat and they can only be differentiated in the hand.

- **Natterer's bat *Myotis nattereri*; and**
- **Bats of the *Myotis* genus[4]**

In total 1,765 calls were identified as bat passes during the static detector surveys. The species with the highest total percentage activity was Leisler's bat (66.01%). Common pipistrelles were the second highest recorded bat species (15.81%). Unidentified bats of the *Pipistrellus* genus were represented in the recordings. Bats of the *Myotis* genus were a small percentage of the overall (2.25%).

During the walked transects, a total of, 372 bat passes were recorded from August to October 2012. Soprano pipistrelle bats made up 33% of the total bat passes recorded (transect and listening points), with common pipistrelle accounting for a further 32% of bat passes.

3.1.4 Summary 2013

In 2013 surveys were completed broadly following the methodology suggested in the Bat Survey-Good Practice Guidelines (Hundt, 2012).

Approximately 75.5% of the Proposed Development site was accessible. A series of walked dusk activity surveys were carried out between May and the end of July 2013. The activity surveys were carried out following predetermined transects and listening points which incorporated the proposed tower locations and linear features such as tree lines and hedgerows. The transects completed were those that had been previously surveyed in 2010, 2011 and 2012. Listening points were again employed along each transect, in accordance with the BCT Good Practice Bat Survey Guidelines (Hundt, 2012).

Of the 102 proposed overhead line tower locations, 65 were surveyed in 2013 (where the surveyor had access to the field in which the proposed tower was located); the remaining 37 proposed tower locations could not be surveyed as land access was not permitted. Of the 65 proposed tower locations surveyed, over half (47) were surveyed twice and on 11 of these occasions the opportunity was taken to rotate the survey direction to reduce the potential bias related to the time of the survey work. The remainder of the proposed tower locations (18) were surveyed only once during 2013 which did not present the opportunity to rotate the survey direction and limit bias. Out of the total of 65 proposed tower locations surveyed in 2013, 24 had previously been surveyed in 2012.

The 2013 bat activity and emergence, re-entry surveys identified the following species within the survey area:

- **Common pipistrelle;**
- **Leisler's bat;**
- **Bat of the *Myotis* genus;**
- **Bat of the *Pipistrellus* genus;**
- **Soprano pipistrelle;**
- **Nathusius' pipistrelle; and**
- **Unidentified bat[5]**

A total of 708 bat calls were recorded. Of these common pipistrelle was the most encountered bat (30.9% of records) and Leisler's bat was the second most encountered (21.61% of records).

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[4] The term "*bat of the Myotis genus*" was used in cases where a myotid bat was recorded but due to limitations in the detection equipment further species identification was not possible.

5 The category "Unidentified bat" was used in cases where a bat was seen and not heard, or where there was evidence of bat presence but there was file distortion in the recording, resulting in non-identification. This term was also used with only social calls were produced by the bat and species could not be determined.

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3.1.5 Inter Year Survey Summary

Table 3 presents a summary of the survey effort conducted to date. For completeness the 2015 survey effort is also included to present a summary of all bat surveys conducted in proximity to the proposed development. To provide an indication of the potential impact of the development, linear features with the potential for impact are listed according to habitat type.

Table 3: Substation, structures and associated linear features affected by the Proposed Development

Structure no	Habitat Type	Dates surveyed for bats				Amount of survey
		2009/2010	2012	2013	2015	
Substation		Y	Y	Y	Y	4
1	No linear feature impacted	Y	Y	Y	Y	4
2	No linear feature impacted	Y	Y	Y	Y	4
3	No linear feature impacted	Y	Y	Y	Y	4
4	No linear feature impacted	Y	N	Y	Y	3
5	No linear feature impacted	N	N	Y	N	1
6	No linear feature impacted	Y	Y	Y	N	3
7	No linear feature impacted	N	Y	Y	N	2
8	No linear feature impacted	N	Y	Y	Y	3
9	Fence	N	Y	Y	Y	3
10	Species-Poor Intact Hedge	N	N	Y	Y	2
11	No linear feature impacted	Y	Y	Y	N	3
12	No linear feature impacted	Y	N	Y	Y	3
13	No linear feature impacted	Y	Y	Y	Y	4
14	Species-Poor Intact Hedge	N	N	Y	N	1
15	Species-Poor Intact Hedge	Y	Y	Y	N	3
16	No linear feature impacted	Y	Y	Y	N	3
17	Dry Ditch / Field Drain/Fence	N	N	N	N	0
18	Species-Poor Intact Hedge	Y	N	N	N	1
19	No linear feature impacted	Y	N	N	N	1
20	Species-Poor Intact Hedge	Y	N	Y	Y	3
21	Species-Poor Intact Hedge	N	N	Y	N	1
22	No linear feature impacted	N	N	N	N	0
23	Species-Poor Hedge With Trees	Y	N	Y	Y	3
24	Species-Poor Intact Hedge	N	Y	Y	Y	3
25	No linear feature impacted	N	Y	Y	Y	3
26	No linear feature impacted	Y	Y	Y	N	3
27	No linear feature impacted	N	Y	Y	N	2
28	Species-Poor Intact Hedge	Y	Y	Y	N	3
29	No linear feature impacted	Y	Y	Y	N	3

Capabilities on project:
Environment

Structure no	Habitat Type	Dates surveyed for bats				Amount of survey
		2009/2010	2012	2013	2015	
30	Species-Poor Intact Hedge	N	Y	Y	N	2
31	No linear feature impacted	N	Y	N	N	1
32	No linear feature impacted	Y	Y	N	N	2
33	Species-Poor Intact Hedge	Y	Y	N	N	2
34	No linear feature impacted	Y	Y	Y	N	3
35	No linear feature impacted	N	Y	N	N	1
36	No linear feature impacted	N	Y	N	N	1
37	Fence	N	Y	N	N	1
38	No linear feature impacted	N	Y	N	N	1
39	No linear feature impacted	Y	Y	N	N	2
40	No linear feature impacted	Y	Y	N	N	2
41	No linear feature impacted	N	Y	Y	N	2
42	Running Water	Y	Y	Y	N	3
43	No linear feature impacted	Y	Y	Y	N	3
44	Species-Poor Intact Hedge	N	Y	Y	N	2
45	No linear feature impacted	N	Y	Y	N	2
46	No linear feature impacted	N	Y	Y	N	2
47	No linear feature impacted	N	Y	Y	N	2
48	Species-Poor Intact Hedge	N	Y	Y	Y	3
49	No linear feature impacted	Y	Y	Y	Y	4
50	No linear feature impacted	N	Y	Y	Y	3
51	Dry Ditch / Field Drain	Y	Y	Y	Y	4
52	No linear feature impacted	N	Y	Y	Y	3
53	Species-Poor Intact Hedge	Y	Y	Y	N	3
54	No linear feature impacted	Y	Y	N	N	2
55	No linear feature impacted	Y	Y	Y	N	3
56	No linear feature impacted	Y	Y	N	N	2
57	No linear feature impacted	N	N	N	N	0
58	No linear feature impacted	Y	Y	N	N	2
59	No linear feature impacted	Y	Y	Y	Y	4
60	No linear feature impacted	Y	Y	Y	Y	4
61	No linear feature impacted	N	Y	Y	Y	3
62	Species-Poor Intact Hedge	N	Y	Y	N	2
63	No linear feature impacted	Y	Y	Y	Y	4
64	No linear feature impacted	Y	Y	Y	Y	4

Capabilities on project:
Environment

Structure no	Habitat Type	Dates surveyed for bats				Amount of survey
		2009/2010	2012	2013	2015	
65	Species-Poor Intact Hedge/Dry Ditch/Field Drain	N	Y	Y	Y	3
66	No linear feature impacted	N	N	N	N	0
67	Dry Ditch / Field Drain	N	Y	Y	N	2
68	Species-Poor Intact Hedge	Y	Y	Y	N	3
69	No linear feature impacted	N	Y	N	N	1
70	No linear feature impacted	N	Y	N	N	1
71	No linear feature impacted	N	N	N	N	0
72	No linear feature impacted	Y	N	N	N	1
73	No linear feature impacted	N	Y	N	N	1
74	No linear feature impacted	N	Y	Y	N	2
75	No linear feature impacted	Y	Y	Y	N	3
76	Species-Poor Intact Hedge	Y	Y	N	N	2
77	No linear feature impacted	N	Y	Y	N	2
78	Species-Poor Hedge With Trees	N	Y	Y	N	2
79	Species-Poor Hedge With Trees	N	Y	Y	N	2
80	Species-Poor Hedge With Trees	Y	Y	Y	N	3
81	Species-Poor Intact Hedge	N	Y	Y	N	2
82	No linear feature impacted	Y	Y	Y	N	3
83	No linear feature impacted	Y	Y	Y	N	3
84	No linear feature impacted	N	Y	N	N	1
85	Species-Poor Intact Hedge/Dry Ditch/Field Drain	N	N	N	N	0
86	No linear feature impacted	N	Y	N	N	1
87	Species-Poor Intact Hedge	Y	Y	Y	N	3
88	Species-Poor Intact Hedge	Y	Y	N	N	2
89	No linear feature impacted	Y	N	N	N	1
90	Species-Poor Intact Hedge	Y	N	N	N	1
91	No linear feature impacted	Y	Y	Y	N	3
92	No linear feature impacted	N	N	N	N	0
93	No linear feature impacted	Y	Y	N	N	2
94	No linear feature impacted	Y	Y	N	N	2
95	No linear feature impacted	Y	Y	N	N	2

Structure no	Habitat Type	Dates surveyed for bats				Amount of survey
		2009/2010	2012	2013	2015	
96	No linear feature impacted	Y	N	N	N	1
97	No linear feature impacted	Y	Y	Y	N	3
98	No linear feature impacted	Y	Y	N	N	2
99	Species-Poor Intact Hedge	N	Y	Y	N	2
100	No linear feature impacted	Y	Y	Y	N	3
101	No linear feature impacted	Y	Y	N	N	2
102	Species-Poor Intact Hedge	Y	Y	N	N	2

In all cases, the amount of survey was dictated by the amount of land access granted and the safety conditions at each of the tower base locations. Of the 102 tower locations, there are 28 tower locations that will impact a hedgerow (Species-Poor Intact Hedge / Species-Poor Hedge With Trees). Of these 28 locations, only one has never been subject to a bat survey (T85). The linear feature affected by T 85 is a species poor intact hedge/dry ditch.

3.2 Activity Surveys and Bat Emergence – Re-entry and 2015

Nocturnal site visits were completed in July and September 2015. The dates are summarised in Table 1. Figures showing the locations and flight lines of bats observed are presented in Appendix B and the results of the surveys are presented in Appendix C.

3.2.1 Activity Surveys

The descriptions of the results of the 2015 activity surveys commence at the substation (the most northern part of the Proposed Development and survey area) and finish at T64 (the most southern part of the 2015 survey area). The description of the results includes a summary of the surveyor's notes and type of activity recorded during the survey and finally, the species of the first and last bat recorded.

3.2.1.1 22 July 2015 - Substation

The survey began at the most southern part of the transect and proceeded clockwise around the proposed substation site. The survey began at 21:14 but it rained between 21:27 and 21:33. Leisler's bats were seen as well as heard and appeared to originate from the direction of the farm (located to the west of the Proposed Development, which will not be affected). Leisler's bats were seen circling the site and then leaving. Activity around the site was quite low but was dispersed along the transect. The majority of bats heard were Leisler's bats, with soprano and common pipistrelles also recorded. A Natterer's bat was heard at the access to the Trewmount Road. The majority of calls were commuting calls. A single foraging call was heard by the surveyor but not recorded.

The first bat heard was a Leisler's bat seen circling fields at 22:01 (17 minutes after sunset). This record was followed by another Leisler's bat approximately 30 seconds later. There was some activity between 22:01 and 22:30, but activity became more frequent between 22:30 and 22:55, as the northern part of the site was surveyed. At 23:06, a common pipistrelle was

seen commuting along the eastern boundary of the substation site. The last bat heard was a Leisler's bat heard commuting at a tree line in the site which has two known bat roosts[6].

3.2.1.2 10 September 2015 - Substation

The survey began along the eastern boundary of the substation site. There was very little activity recorded. The first bat heard was a Leisler's bat, heard at 20:26 (26 minutes after sunset). Along the southern boundary, there was continuous Leisler's bat activity between 20:26 and 20:28. A Nathusius' pipistrelle was heard at the eastern listening stop. Further activity was heard along the northern section of the transect. Soprano and common pipistrelles were recorded commuting around the tin roofed shed, which had been previously identified as a transient roost (2013). The last bat heard was a Leisler's bat, at 21:57.

3.2.1.3 22 July 2015 – T3-T4

The survey was limited by the presence of livestock in a field which resulted in the immediate area surrounding proposed T3 not being surveyed. The surveyor considered that there was comparatively a lot of activity during the survey but it was limited to the lanes and hedge lines around the site. For most of the survey, there was continuous feeding around the farm buildings on the transect route. The transect was completed three times during the course of the survey period. There was a brief rain shower between 22:00 and 22:10. A Soprano pipistrelle was heard commuting at the location of T4. There were occasions of continuous soprano pipistrelle foraging at 22:41, 22:49 and 23:15. The continuous foraging recorded at 23:15 was interspersed with social calls. The majority of calls were from common and soprano pipistrelles interspersed with Leisler's bat calls.

The first bat recorded was a Leisler's bat recorded 22:12 (28 minutes after sunset). The surveyor heard commuting and foraging activity from soprano and common pipistrelles. The last bat recorded was a common pipistrelle recorded commuting at 23:45.

3.2.1.4 10 September – T3-T4

The survey was limited to the laneway and hedge lines because of livestock in the fields. The transect circuit was completed twice. Only T4 was surveyed as T3 was again inaccessible. Activity was constant until the end of the survey but there was a 20 minute gap between the first bat heard and the next bat heard. Activity was heard as mainly commuting with some foraging calls by Leisler's bats and common pipistrelles. The first bat (Leisler's bat) was heard at 20:25, 25 minutes after sunset. Nathusius' pipistrelles were heard at 20:48 and 21:09, although the calls were quite faint. The last bat (soprano pipistrelle) was heard at 21:56.

3.2.1.5 22 July 2015 – T8-T10

The surveyor did not follow the predetermined transect, but surveyed along the boundaries of the fields that contained the towers. This was to maximise the amount of activity recorded in the area because the tower locations were in the middle of fields. Activity was recorded as sporadic. The dominant activity was commuting, with concentrated bursts of foraging activity. The species heard were soprano pipistrelles, Leisler's bats and common pipistrelles. Soprano pipistrelles were seen and heard commuting and foraging around the hedge lines close to T8 and T9. The first bat heard was a soprano pipistrelle (commuting at 22:24). The last bat heard was also a soprano pipistrelle, (commuting at 23:46).

[6] **One of the roosts had originally been identified in 2008 and the other was identified as part of the 2015 survey.**

3.2.1.6 16 September 2015 – T8-T10

Due to livestock, T10 could not be accessed. T8 and T9 were surveyed but no bats were heard at the proposed location of the tower bases. There was not a lot of activity but, bats heard were generally commuting. The first bat heard was a common pipistrelle commuting at 20:29 (47 minutes after sunset). This was also the first bat seen foraging around a building to the north of T9. This was followed by a minute of constant foraging. There was another period of constant foraging between 20:49 and 20:52 by a Leisler's bat. The last bat heard was a bat of the *Pipistrellus* genus, heard commuting at 21:06.

3.2.1.7 22 July 2015 – T12–T13

Activity was concentrated along hedge lines and Rhone Road. The surveyor recorded common and soprano pipistrelles, Leisler's bats and a bat of the *Myotis* genus. A potential Leisler's bat roost is present to the east of the Proposed Development because the first bat was heard commuting eight minutes after sunset in this area. The potential roost is in a tree line which will not be affected as a result of the Proposed Development. The first bat heard was a Leisler's bat heard commuting eight minutes after sunset at a hedge which will be over sailed by the Proposed Development, but due to the direction of the bat, the surveyor concluded the roost was to the south east of this listening stop. At 22:29 (45 minutes after sunset), a bat of the *Myotis* genus was recorded commuting along a ditch to the south west of the proposed location of T12. The last bats heard were two common pipistrelles, commuting along Rhone Road between 23:48 and 23:49.

3.2.1.8 16 September 2015 – T12-T13

Activity was fairly steady throughout the survey. Activity was predominantly commuting, with just one foraging Leisler's bat recorded. Common and soprano pipistrelles, Leisler's bats and a bat of the *Myotis* genus were heard during the survey. A soprano pipistrelle was seen commuting along a farm track at 20:38; a common pipistrelle was also heard commuting at the proposed location of T13 (which the farm track led to). The first bat heard was a Leisler's bat heard at 19:53, 11 minutes after sunset. At 20:38, a bat of the *Myotis* genus was recorded commuting. The last bat (Leisler's bat) encountered was observed at 21:27.

3.2.1.9 29 July 2015 – T20, T23 – T25

During the survey, seven common pipistrelles where observed emerging from a building described as a farm building/granny flat, between 21:50 and 22:01 to the east of the access track to T20. This farm building/granny flat is not on the route of the Proposed Development and will not be affected as a result of the Proposed Development.

Species heard during the survey were common pipistrelles, soprano pipistrelles and at 23:23, a Nathusius' pipistrelle was heard 1 hour and 53 minutes after sunset, commuting at a river crossing. The majority of activity was commuting behaviour with occasional foraging calls. The first bat (common pipistrelle) was heard at 21:50, 20 minutes after sunset (emerging from the aforementioned building). At 22:27, a soprano pipistrelle was heard commuting at the proposed location of T20. The last bat heard was the Nathusius' pipistrelle recorded crossing the river at 23:23. No other bats were heard during the remaining 13 minutes of the survey.

3.2.1.10 16 September 2015 - T20, T23

Activity across the transect was sporadic, but the most activity was heard along the wooded lane way, where activity had previously been identified in 29 July 2015. The most northern section of the transect was not surveyed on the 16 September because of issues with livestock in the field.

The species heard were Leisler's bat, common pipistrelle and whiskered bat. The majority of activity was commuting with two instances of commuting and foraging. Commuting and foraging was heard at 20:10 by a Leisler's bat and at 21:24 by a common pipistrelle (this was the last bat heard during the survey). The first bat heard was a Leisler's bat, commuting at 20:07, 35 minutes after sunset. At 20:24, a common pipistrelle was seen flying at a height of 3m along the wooded lane way. At

21:10 (35 minutes after sunset), a whiskered bat was heard commuting along the lane way. The last bat heard was a common pipistrelle commuting and foraging along the laneway at 21:24.

3.2.1.11 28 September 2015 – T23-T25

The surveyor encountered few bats. The lack of bats may have been because there were very few insects, or, as the survey continued a mist descended. The first bat was a Leisler's bat, heard at 21:04 (1 hour and 53 minutes after sunset). Bats were sporadically heard at listening stops around the transect route, including at the stream which crossed the site. At 22:05, a common pipistrelle was recorded commuting at the location of T25. At 22:08, a common pipistrelle and soprano pipistrelle were heard commuting, foraging and making social calls along a tree line. These were the last bats recorded during the survey.

3.2.1.12 29 July 2015 – T48

Activity was reported as being constant between 22:15 and 23:25 along the transect. The dominant activity was commuting with three instances of commuting and foraging. Common and soprano pipistrelles and Leisler's bats were recorded throughout the survey. The first bat was a common pipistrelle, heard at 22:15 (45 minutes after sunset). Periods of continuous activity by these 3 species occurred at approx. 22:23, with 3 minutes of Leisler's bats, 3 minutes of common pipistrelles and 2 minutes 6 seconds of soprano pipistrelle activity. Some foraging by Leisler's bats and soprano pipistrelles was also observed. The last bat recorded was a soprano pipistrelle, recorded commuting at 23:25.

3.2.1.13 15 September 2015 – T48

There was sparse activity across the transect. The dominant activity was commuting. Common and soprano pipistrelles and Leisler's bats were recorded during the survey. The first bat heard was a soprano pipistrelle recorded foraging at 20:33 (48 minutes after sunset) and the last bat recorded was a Leisler's bat heard commuting at 21:34.

3.2.1.14 29 July 2015 – T49-T51

The transect route was amended because access was not available to one of the fields. The surveyor movement around the transect was slowed by the presence of bullocks in fields. Such fields were present throughout the transect. Despite, the optimal conditions, there were very few bats heard. The first bat heard was a Leisler's bat heard at 21:51 (21 minutes after sunset) at the proposed location of T49. The last bat heard was a soprano pipistrelle heard at 22:59.

3.2.1.15 15 September 2015 – T49-T51

The transect was amended to go around a field to which the surveyor did not have access. Commuting was the most prevalent activity with occasional foraging. Common and soprano pipistrelles and Leisler's bats were heard during the survey. The first bat heard was a common pipistrelle, heard at 20:15 (30 minutes after sunset). The last bat heard was a common pipistrelle heard at a listening stop, commuting in the field associated with T50. This bat was heard at 21:34.

3.2.1.16 25 July 2015 – T59-T60

The activity survey was completed in an area of the study area in which a transient tree roost had been previously identified (13 June 2009), to the east of T60. The level of activity was considered average for the Proposed Development. From the beginning of the survey, bats were recorded at a constant rate, with activity focused around the tree line (which will be cut but not removed as a result of the Proposed Development) and the laneway (which will not be altered). During the transect, a soprano pipistrelle was seen emerging from the previously identified roost at 21:55 (16 minutes after sunset). In addition to the soprano pipistrelle seen emerging, there were three other soprano pipistrelles seen flying around the tree line. All the other bats recorded, were heard not seen. The last bat heard was a soprano pipistrelle recorded commuting at 23:40.

Capabilities on project:
Environment

3.2.1.17 15 September 2015 – T59-T60

The activity level was considered low, but constant throughout the survey. The first bat seen was at 20:07 (22 minutes after sunset) when a common pipistrelle emerged from a tree to the north west to the proposed location of T60 (a roost which had not been previously identified). At 20:24, a common pipistrelle was seen commuting along a tree line to the west of the proposed location of T59. In addition to the roost emergences, social calls attributed to soprano and common pipistrelles were heard. Furthermore, social calls that could not be attributed to a particular species of bat were also heard. The majority of calls were recorded at listening stops. Common pipistrelles were recorded along the access track. The last bat heard was a common pipistrelle at 21:43.

3.2.1.18 24 July 2015 – T61

The northern part of the transect was not completed because the surveyor could not get access to the field, as dense vegetation, a ditch and a fence blocked the surveyor's way. In this transect, activity was concentrated in the boundaries around T61. Activity was a split between foraging and commuting. The first bat heard was a common pipistrelle recorded commuting in the hedge line which the surveyor could not penetrate. A common pipistrelle was heard at 22:32 (51 minutes after sunset), but was not seen. There was activity in the boundaries to both the east and west of the proposed T61 location. The last bat heard was a soprano pipistrelle heard foraging in the hedge line to the west of the proposed location of T61.

3.2.1.19 14 September 2015 – T61

Activity was considered relatively constant throughout the survey. Activity was dominated by commuting with occasional foraging activity also recorded. The species heard were common and soprano pipistrelles and Leisler's bats. The first bat heard was a soprano pipistrelle commuting at 20:02 (16 minutes after sunset). At 21:31, a common pipistrelle was seen commuting along a lane way element of the transect at 8-10m above the ground. At 21:47, the last bat heard was a common pipistrelle commuting along the aforementioned lane way.

3.2.1.20 24 July 2015 – T62 -T63

The surveyor heard a lot of Leisler's bat activity (foraging and commuting) around the field in which T62 is proposed. There was additional activity at the treeline to the north of the field which will contain T63.

The first bat heard was a Leisler's bat at 21:54 (13 minutes after sunset). The bat was seen flying around the field which contains proposed T62. The timing of this emergence suggests that there is a Leisler's roost close to the T62 proposed location. However, the direction from which the Leisler's bats came, was from the field which will have an access track and will not result in any vegetation or structures being removed, thereby safeguarding the roost location. There were pockets of activity around the field which will contain T62 and in the tree line to the north of the field which will contain T63.

3.2.1.21 14 September 2015 – T62-T63

The surveyor heard bats across the transect but not in large numbers. During the survey, there was heavy rain between 20:29 and 20:35. After the rain, the next bat was heard at 21:06. A brown long-eared bat was heard along a mature tree line which will not be severed as a result of the Proposed Development. Part of the transect was not completed because of livestock in a field.

The first bat seen was a common pipistrelle, seen flying at 5m around the first listening stop on the transect. This listening stop was at the location of a treeline which had been felled between the 2013 and 2015 bat survey. The common pipistrelle was seen flying at 20:02 (33 minutes after sunset). A brown long eared bat was heard at 21:06 (1 hour and 19 minutes after sunset). The presence of the brown long eared bat may indicate a roost near-by as they stay close to their roosts to forage

(Russ, 2012) but as mean emergence time is between 45 minutes and 60 minutes, it is unlikely. The last bat heard was a common pipistrelle at 21:47, which was heard but not seen.

3.2.1.22 24 July 2015 – T64

Activity was constant throughout the survey. Leisler's bats were seen flying around the area which is the proposed location of T64. Activity was split between commuting and foraging. Common and soprano pipistrelles and Leisler's bats were heard commuting. The first bats encountered were two Leisler's bat seen commuting and foraging to the north east of T64 at 21:51 (10 minutes after sunset). Between 21:51 and 21:53, Leisler's bats where seen foraging and commuting in the same area. Between 21:56 and 22:08, a Leisler's bat was seen commuting and foraging over a field to the north west of proposed location of T64. At 23:42, the last bat heard was a commuting common pipistrelle.

3.2.1.23 14 September 2015 – T64

Activity was constant throughout the survey. Common and soprano pipistrelles, a Leisler's bat and a bat of the *Myotis* genus were all heard during the survey. Activity was dominated by commuting with occasional foraging activity. The first bat heard was a common pipistrelle recorded commuting at 20:18 (31 minutes after sunset). At 20:51, a bat of the *Myotis* genus was heard commuting. At 21:15, a Leisler's bat was heard commuting. The last bat heard was a common pipistrelle heard commuting at 21:52.

3.2.2 Emergence Surveys

In July and September, there were a total of six emergence surveys completed. These were conducted at the substation site and at the proposed location of T60. The emergence surveys completed at the substation site were completed on a tree line and the tin roofed shed, both of which had previously been identified as a bat roost. The structures on the proposed substation site were surveyed in July and September. An emergence survey was carried out on the tree line to the west of the proposed locations of T59 and T60 in September. Two surveyors were placed on the eastern and western sides of the tree line to ensure that potential bats emerging would be detected on either side of the treeline.

3.2.2.1 30 July 2015 – Tin roofed shed on substation site

Two common pipistrelle bats emerged from the tin roofed shed at 22:02 and 22:21 (32 minutes and 51 minutes after sunset), confirming the structure as a roost. The structure had been previously identified as a roost in 2013. During the survey, there was a steady stream of activity around the tin roofed shed and its surrounding trees. The majority of activity was commuting, with some foraging. The first bat heard was a Leisler's bat heard commuting at 21:35, (5 minutes after sunset). During the survey, Leisler's bats, common and soprano pipistrelles, and bats of the *Pipistrellus* genus were recorded. The last bat heard was a soprano pipistrelle (foraging) at 23:08.

3.2.2.2 23 September 2015 Tin roofed shed on substation site

There was very little activity and no bats were seen emerging from the tin roofed shed. The first bat heard was a Leisler's bat heard commuting at 19:55 (31 minutes after sunset). The last bat heard was a soprano pipistrelle seen commuting along the eastern side of the tin roofed shed at 20:30. The survey stopped at 21:24 because of rain.

3.2.2.3 30 July 2015 Tree line on substation site

The first bat seen was emerging from a tree along the tree line (but not the tree originally identified as a roost in the 13 June 2009 survey). Activity was predominantly recorded as commuting, but some foraging along the tree line was also observed. Activity was considered relatively steady throughout the survey, with few periods of no activity recorded. A soprano

pipistrelle was seen emerging at 21:54 (24 minutes after sunset) from the tree to the west of the tree originally identified as a roost. The next bats seen were soprano pipistrelles (3 in total) foraging along the tree line between 22:11 and 22:20 (41 and 47 minutes after sunset). Bats were commuting and foraging along the tree line throughout the survey. The last bat heard was a soprano pipistrelle (commuting) at 23:22.

3.2.2.4 23 September 2015 Tree line on substation site

During, the September emergence survey of the tree line on the substation site, there was very little activity and no bats were seen emerging from the tree line. The survey was stopped at 20:55 because of rain. The survey was due to stop at 21:24 and thus had continued for an hour and 30 minutes.

The first bat heard was a common pipistrelle commuting along the tree line at 19:42 (28 minutes after sunset). The time after sunset indicates a potential roost in the tree line. At 19:54, a Leisler's bat was heard commuting. The last bat heard was a Leisler's bat heard commuting overhead at 20:20.

3.2.2.5 24 September2015 Tree line in vicinity of T59-T60 (western side)

Pre dusk, there were some flies and a light breeze. There was a light shower at 19:58 and 2/3 of the moon was present and unobstructed, resulting in a lot of light being present. There was not a lot of activity. The first bat heard was a Leisler's bat, commuting at 19:49 (28 minutes after sunset). The first bat seen was not recorded and was seen flying in the vicinity of proposed T60 at 19:59 (38 minutes after sunset). It was not seen where the bat went. Leisler's bats were heard flying overhead. At 20:08, a common pipistrelle was heard in the tree line behind the surveyor. Another common pipistrelle was heard commuting at 20:22 and the last bat heard was a common pipistrelle commuting (at 21:14) in the hedge line adjacent to the proposed location of T60.

3.2.2.6 24 September 2015 Tree line in vicinity of T59-T60 (eastern side)

No bats were seen emerging from the trees within the treeline. There was very little activity recorded during the survey. The first bat heard was a Leisler's bat which was recorded at 19:49 (1 hour and 40 minutes after sunset). At 19:58, a bat of the *Pipistrellus* genus was seen flying around a tree. From 19:59 until 21:42, there was very little activity but sporadic Leisler's bats and common pipistrelles were heard. At 22:04, the surveyor moved position closer to a boundary and bats of *Pipistrellus* genus were recorded from 22:04 to 22:07. The last bat heard during the survey, was an unidentified bat which was heard commuting at 22:22.

3.2.3 Re-entry surveys

In July and September, there were a total of six re-entry surveys completed to coincide with the emergence surveys previously reported. These were at the substation site and at T60. The re-entry surveys completed at the substation site were completed on a tree line which had previously been identified as a bat roost and the tin roofed shed. These structures were surveyed in both July and September. A tree line to the west of T59 and T60 was surveyed in September 2015. Two surveyors were placed on the eastern and western sides of the tree line, to replicate the survey coverage used on the emergence survey.

3.2.3.1 31 July 2015 - Tin roofed shed on substation site

The re-entry survey was of the tin roofed shed that was identified as a bat roost in 2013. At 04:24, there was a slight breeze which dropped at 05:10. This did not appear to affect the survey as bats were heard through the survey. At 04:45 (50 minutes before sunrise) a non-echolocating bat flew into the tin roofed shed in the vicinity of a sycamore tree growing within the tin roofed shed's western wall. The first bat heard was a soprano pipistrelle heard commuting at 03:34. At 04:52, a Leisler's bat began foraging and foraged until 05:10 (25 minutes before sunrise). This was the last bat heard.

3.2.3.2 24 September 2015 - Tin roofed shed on substation site

There was very little activity and no bats were seen entering the tin roofed shed. The first bats heard were two soprano pipistrelles, heard commuting at 04:49. The last bat heard was a soprano pipistrelle heard commuting and making social calls at 06:13 (1 hour and 1 minute before sunrise).

3.2.3.3 31 July 2015 - Tree line on substation site

The first bat heard was a soprano pipistrelle, commuting around the tree line at 03:53. Activity was constant, with occasional bats seen flying around the tree line. At 04:50 (44 minutes before sunrise) a soprano pipistrelle was seen re-entering a damaged tree to the east of the roost identified in the 2008 survey. The last bat heard was at 05:52 (33 minutes before sunrise). It was a commuting Leisler's bat.

3.2.3.4 24 September 2015 - Tree line on substation site

The re-entry survey of the tree line on the substation had very little activity and no bats were seen re-entering the tree line. Wind began to gust at 05:48 but this dropped at 06:20. At 07:12, the wind began gusting again. The first bat heard was an unidentified bat making social calls at 05:17. The activity was sporadic and was only recorded between 05:17 and 05:40. The last bat heard was a soprano pipistrelle heard commuting at 05:40, 1 hour and 35 minutes before sunrise.

3.2.3.5 25 September 2015 - Tree line in vicinity of T59-T60 (western side)

The survey was a re-entry survey completed at the tree line between T59 and 60. Rain (occasional spitting) began at 05:17 and stopped at 05:23. There were two bats heard during the entire survey. A common pipistrelle was heard commuting at 06:15 and an unidentified bat was heard making social calls while flying along the tree line towards T59 (38 minutes before sunrise).

3.2.3.6 25 September 2015 - Tree line in vicinity of T59-T60 (eastern side)

The surveyor did not record any activity on the eastern side of the tree line during the re-entry survey.

3.2.4 2015 Results Totals

In addition to survey summaries presented in Section 3.2 and result tables presented in Appendix C, the results of the surveys have also been presented in the same format as the 2013 bat report (AECOM, 2013) to aid comparison between the two sets. The original 2013 results tables have been included in Appendix D for reference.

Capabilities on project:
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Table 4 : Results of 2015 dusk transect surveys – numbers of bats and bat passes recorded

Date	Survey	Proposed Tower Transects	Common pipistrelle	Leisler's bat	Bat of the *Myotis* genus	Soprano pipistrelle	Nathusius' pipistrelle	Whiskered bat	Natterers bat	Brown long-eared bat	Bat of the *Pipistrellus* genus	Unidentified Bat	Survey Total
22/07/2015	Dusk	T1-T2	1	10		2			1				14
22/07/2015	Dusk	T3, T4, T5	10	4		16					1		31
22/07/2015	Dusk	T8, T9, T10	3	3		7							13
22/07/2015	Dusk	T12, T13	10	17	1	8							36
24/07/2015	Dusk	T61 Access Road Area	16	2		5							23
24/07/2015	Dusk	T62 - T63	16	19		6							41
24/07/2015	Dusk	T64	11	15		3							29
25/07/2015	Dusk	T59 - T60	18	5		1					1		25
29/07/2015	Dusk	T49 T50 T51	1	1		4							6
29/07/2015	Dusk	T48	5	5		12							22
29/07/2015	Dusk	T20, T21, T22, T23, T24, T25	21			13	1						35
09/09/2015	Dusk	T1, T2	2	3		2	2						9
09/09/2015	Dusk	T3, T4	19	12		13	2						46
14/09/2015	Dusk	T61	13	7		19							39
14/09/2015	Dusk	T62, T63	4	1		3				1	2	1	12
14/09/2015	Dusk	T64	21	1	1	13							36
15/09/2015	Dusk	T49, T50, T51, T52	7	9		10							26
15/09/2015	Dusk	T48	4	6		4							14
15/09/2015	Dusk	T59, T60	15	3		2						2	22
16/09/2015	Dusk	T8, T9	5	4							1		10
16/09/2015	Dusk	T12, T13	18	10	1	6							35
16/09/2015	Dusk	T20, T21, T22, T23	6	2		1		2					11
28/09/2015	Dusk	T23, T24, T25	11	2		2					1		16

Capabilities on project:
Environment

Date	Survey	Proposed Tower Transects	Common pipistrelle	Leisler's bat	Bat of the *Myotis* genus	Soprano pipistrelle	Nathusius' pipistrelle	Whiskered bat	Natterers bat	Brown long-eared bat	Bat of the *Pipistrellus* genus	Unidentified Bat	Survey Total
TOTAL			237	141	3	152	5	2	1	1	6	3	551

The total number of bats recorded during all the transect surveys is 551 bats. The species with the highest number recorded over the transect surveys was common pipistrelle with 253 (45.91%) bats recorded and Leisler's bat was the second highest with 160 (29.08%) bats recorded. Of the species recorded the least recorded bat was a Natterers bat and Brown long-eared bat with one record of each species recorded during the transects. During the 2015 surveys, there were no Daubenton's bats recorded.

The transect with the largest number of bats identified was transect T3, T4 at 09 September 2015 and the second largest number of bat passes on a transect was observed on 24 July 2015 while surveying T62-T63. The data was analysed in MS Excel and used to give an estimate of relative bat activity displayed as Bat Activity Index (BAI). Table 5 provides the length of surveys used to measure BAI. Table 6 provides the BAI for each of the species encountered on each of the dusk activity surveys.

Table 5 : Date and Time Units (Dusk Surveys)

Date	Length of survey (hrs)
22/07/2015	2.5
24/07/2015	2.5
25/07/2015	2.5
29/07/2015	2
09/09/2015	2.62
14/09/2015	2
15/09/2015	2.5
16/09/2015	2.5
28/09/2015	2.5

Table 6 : Bat Activity Index (BAI) for the 2015 dusk activity results

Date	Survey	Proposed Tower Transects	Common pipistrelle	Leisler's bat	Bat of the *Myotis* genus	Soprano pipistrelle	Nathusius' pipistrelle	Whiskered bat	Natterers bat	Brown long-eared bat	Bat of the Pipistrellus genus	Unidentified Bat	Survey Total
22/07/2015	**Dusk**	T1-T2	0.40	4.00	0.00	0.80	0.00	0.00	0.40	0.00	0.00	0.00	5.60
22/07/2015	**Dusk**	T3, T4, T5	4.00	1.60	0.00	6.40	0.00	0.00	0.00	0.00	0.40	0.00	12.40
22/07/2015	**Dusk**	T8, T9, T10	1.20	1.20	0.00	2.80	0.00	0.00	0.00	0.00	0.00	0.00	5.20
22/07/2015	**Dusk**	T12, T13	4.00	6.80	0.40	3.20	0.00	0.00	0.00	0.00	0.00	0.00	14.40
24/07/2015	**Dusk**	T61 Access	6.40	0.80	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	9.20

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Date	Survey	Proposed Tower Transects	Common pipistrelle	Leisler's bat	Bat of the *Myotis* genus	Soprano pipistrelle	Nathusius' pipistrelle	Whiskered bat	Natterers bat	Brown long-eared bat	Bat of the Pipistrellus genus	Unidentified Bat	Survey Total
		Road Area											
24/07/2015	**Dusk**	T62, T63	6.40	7.60	0.00	2.40	0.00	0.00	0.00	0.00	0.00	0.00	16.40
24/07/2015	**Dusk**	T64	4.40	6.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	11.60
25/07/2015	**Dusk**	T59 - T60	7.20	2.00	0.00	0.40	0.00	0.00	0.00	0.00	0.40	0.00	10.00
29/07/2015	**Dusk**	T49 T50 T51	0.50	0.50	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00
29/07/2015	**Dusk**	T48	2.50	2.50	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00
29/07/2015	**Dusk**	T20, T21, T22, T23, T24, T25	10.50	0.00	0.00	6.50	0.50	0.00	0.00	0.00	0.00	0.00	17.50
09/09/2015	**Dusk**	T1, T2	0.76	1.15	0.00	0.76	0.76	0.00	0.00	0.00	0.00	0.00	3.44
09/09/2015	**Dusk**	T3, T4	7.25	4.58	0.00	4.96	0.76	0.00	0.00	0.00	0.00	0.00	17.56
14/09/2015	**Dusk**	T61	6.50	3.50	0.00	9.50	0.00	0.00	0.00	0.00	0.00	0.00	19.50
14/09/2015	**Dusk**	T62, T63	2.00	0.50	0.00	1.50	0.00	0.00	0.00	0.50	1.00	0.50	6.00
14/09/2015	**Dusk**	T64	10.50	0.50	0.50	6.50	0.00	0.00	0.00	0.00	0.00	0.00	18.00
15/09/2015	**Dusk**	T49, T50, T51, T52	2.80	3.60	0.00	4.00	0.00	0.00	0.00	0.00	0.00	0.00	10.40
15/09/2015	**Dusk**	T48	1.60	2.40	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	5.60
15/09/2015	**Dusk**	T59, T60	6.00	1.20	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.80	8.80
16/09/2015	**Dusk**	T8, T9	2.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	4.00
16/09/2015	**Dusk**	T12, T13	7.20	4.00	0.40	2.40	0.00	0.00	0.00	0.00	0.00	0.00	14.00
16/09/2015	**Dusk**	T20, T21, T22, T23	2.40	0.80	0.00	0.40	0.00	0.80	0.00	0.00	0.00	0.00	4.40
28/09/2015	**Dusk**	T23, T24, T25	4.40	0.80	0.00	0.80	0.00	0.00	0.00	0.00	0.40	0.00	6.40
TOTAL			4.33	2.58	0.05	2.78	0.09	0.04	0.02	0.02	0.11	0.05	10.07

The transect with the highest BAI was the dusk survey which took place in the vicinity of T61 at 14 September 2015. The second highest BAI on a transect was also on 14 September 2015 at T64.

Capabilities on project:
Environment

3.2.5 Emergence and Re-entry survey results

Table 7 and Table 8 provide the results of the emergence and re-entry surveys. The numbers in these tables relate to the number of bats and bat passes recorded during the survey. It is not a tally of the number of bats that emerged. The presence / likely absence of a roost record are presented in the survey notes column.

Table 7 : Emergence survey results and comments

Date	Survey	Proposed Tower Transects	Common pipistrelle	Leisler's bat	Bat of the *Myotis* genus	Soprano pipistrelle	Nathusius' pipistrelle	Whiskered bat	Natterers bat	Brown long-eared bat	Bat of the *Pipistrellus* genus	Unidentified Bat	Survey Total	Survey Notes
30/07/2015	**Dusk**	At tin roofed shed ir substation site	8	5		5					1		19	Two common pipistrelles emerged from the shed at 22:02 and 22:21 respectively (32 minutes and 51 minutes after sunset).
30/07/2015	**Dusk**	Tree line at substation site	3	5		14							22	A soprano pipistrelle was seen emerging from the tree line.
23/092015	**Dusk**	At tin roofed shed ir substation site	2	2		1							5	No bats were seen emerging from the tin roofed shed.
23/09/2015	**Dusk**	Tree line at substation site	2	2									4	No bats were seen emerging from the tree line.
24/09/2015	**Dusk**	To the west of the tree line at T60	3	3									6	No bats were seen emerging from the tree line.
24/09/2015	**Dusk**	To the east of the tree line at T60	3	4							4	1	12	No bats were seen emerging from the tree line.
TOTAL			**21**	**21**	**0**	**20**	**0**	**0**	**0**		**5**	**1**	68	

Table 8 : Results of re-entry surveys

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Date	Survey	Proposed Tower Transects	Common pipistrelle	Leisler's bat	Bat of the *Myotis* genus	Soprano pipistrelle	Nathusius' pipistrelle	Whiskered bat	Natterers bat	Brown long-eared bat	Bat of the *Pipistrellus* genus	Unidentified Bat	Survey Total	Survey Note
31/07/2015	**Dawn**	At tin roofed shed ir substation site		4		4						1	9	A nor echolocating bat was seen re-entering the tin roofed shed on the western façade at 04:45 (50 minutes before sunrise).
31/07/2015	**Dawn**	Tree line at substation site	8	5	4	13	1					2	33	A soprano pipistrelle re-entered a damaged tree at 04:50 (44 minutes before sunrise). The damaged tree is to the east of the alder tree already identified as a roost in July 2009
24/092015	**Dawn**	At tin roofed shed ir substation site	2		1	9	1						13	No bats were seen re-entering the shed.
24/09/2015	**Dawn**	Tree line at substation site		2		2						2	6	No bats were seen re-entering the tree line.
25/09/2015	**Dawn**	To the west of the tree line at T60	1									1	2	None of the bats were seen re-entering the tree line.
25/09/2015	**Dawn**	To the east of the tree line at T60	0	0	0	0	0	0	0	0	0	0	0	The surveyor did not record any bats on the eastern side of the tree line.
TOTAL			**11**	**11**	**5**	**28**	**2**	**0**	**0**	**0**	**0**	**6**	63	

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In July, two emergence and two re-entry surveys were conducted at the proposed substation location, at the tree line (which contains a previously confirmed roost) and at the tin roofed shed (which is also a previously confirmed roost). Bats were seen emerging and returning from both the tree line (although a different tree to the confirmed roost) and the tin roofed shed. There was verification of where the roost is in the tin roofed shed. Bats emerged and returned to a spot in the shed which is in the vicinity of the sycamore which is growing along the western façade of the tin roofed shed. This area is also used by bats for foraging and commuting.

Four emergence and four re-entry surveys were carried out in September. The emergence, re-entry surveys already completed at the substation site were repeated. Additionally, a tree line to the east of proposed T60 was also surveyed. This tree line was surveyed as it contains a previously confirmed roost in an ash tree. No bats were seen emerging or re-entering any of the sites during September.

Capabilities on project:
Environment

3.3 Results Summary – Key Points

3.3.1 Activity

In July, the most activity was recorded on 24 July 2015 at T62, T63 (41 bats). In September, the most activity was recorded on 09 September 2015 at T3, T4 (46 bats). Common pipistrelle was the most frequent species encountered. The species diversity in the 2015 survey was greater than the 2013 survey, but no Daubentons' bats were recorded in 2015. There was activity throughout the site and during every activity survey, bats were recorded.

3.3.2 Roosts

Roosts were identified within the Proposed Development, during the 2013 survey, these were;

- **The roost in the tin roofed shed in the substation site:**
- **The roost in the alder in the substation site tree line; and,**
- **The roost in the ash in the tree line to the east of T60.**

All of these roosts would be affected as a result of the Proposed Development and in 2015, further surveys took place to characterise the roosts.

The result of these surveys were:

- **The entrance to the roost in the tin roofed shed in the substation site was isolated to the vicinity of a sycamore tree which grows along the western façade of the structure;**
- **There was no activity around the alder tree in the substation in 2015; and,**
- **The roost in the ash tree (east of T60) was identified as part of activity surveys in July 2015 but there was no activity recorded at the tree during the September emergence re-entry surveys.**

In addition to the further characterisation of the roosts which were present in 2013, three further roosts were identified. These were;

- **A roost in a damaged tree to the east of the alder on the substation site;**
- **A roost in an ash tree further north of the existing ash tree roost in the tree line to the east of the T60; and,**
- **A roost in a granny flat/agricultural building to the east of the access track servicing T20.**

Of these three roosts, only the roost in the granny flat/agricultural building will not be affected by the Proposed Development. All the roosts identified contained single numbers of bats and are considered transient roosts. The 2015 surveys have identified that five roosts will be affected as a result of the Proposed Development, these are:

- **The roost in the tin roofed shed in the substation site;**
- **The roost in the alder in the substation site tree line;**
- **The roost in the ash in the tree line to the east of T60;**
- **A roost in a damaged tree to the east of the alder on the substation site; and,**
- **A roost in an ash tree further north of the existing ash tree roost in the tree line to the east of T60.**

Capabilities on project:
Environment

4 Discussion

Bat activity transects were completed in July and September 2015. The transect routes and associated listening stops are in the vicinity of and broadly follow the routes taken in 2013. The results section summarises the activity and roosts recorded during the surveys and impacts of the development on the bat population. The discussion has further been separated into a discussion relating to how site usage varies between July and September and how activity compares between 2013 and 2015.

4.1 Roost Sites

Roost sites have previously been identified within the Proposed Development. In 2013, two roosts were identified on the proposed substation site; these roosts will be lost as a result of the Proposed Development. A tree roost adjacent to T60 was also identified in 2013.

These sites were all resurveyed in 2015. Of the two roosts identified on the proposed substation site, the roost in the tin roofed shed was confirmed as a transient roost for soprano pipistrelle individuals. The access location has been narrowed to the vicinity of a sycamore tree which grows along the western wall of the tin roofed shed but the exact location has not been confirmed.

A tree within the treeline in the proposed substation site was confirmed in 2013. In 2015, an adjacent tree was identified in the tree line as hosting a roost.

The ash tree adjacent to the proposed location of T60 was confirmed as a transient roost during the activity survey in July 2015 (it had previously been identified as a roost in 2013). A second ash tree to the north of the ash tree (which was confirmed as a roost in 2015, after being identified in 2013) was identified as a transient roost in September during the activity survey but this was not confirmed by an emergence, re-entry survey in September.

4.2 Activity Surveys

In addition to general bat activity, the bat activity surveys also give an indication of roost locations because the times bats are heard can be matched to mean emergence times, to assess if there are any roosts in the wider area surrounding the transect. Table 9 presents the emergence times for selected bat species. The species selected are restricted to those species encountered during the 2015 surveys.

Table 9: Emergence times (adapted from Jones and Rydell, 1994 and Middleton, Froud and French, 2014)

Species	Mean emergence time (Minutes)
Leisler's bat	18
Common pipistrelle	32
Soprano pipistrelle	20
Nathusius' pipistrelle	20
Whiskered bat	32
Natterer's bat	75
Brown long-eared bat	54

As the times presented in Table 9 are mean emergence, a ten minute window either side of the time was used to identify possible roost locations from the results. This was in addition to surveyor observations, where bats were seen flying but their origin was not seen.

During 2013, the activity survey did not identify a mass movement of commuting bats which, indicates the absence of a major roost adjacent to the Proposed Development. However the 2013 report did identify a number of areas where potential roost locations were close by. These are as follows:

- **T1- T2 the first Leisler's Bat was recorded 27mins after sunset there are farm buildings in the vicinity which may support a roost;**
- **T12, 13, 14, 15 the first common pipistrelle was recorded 20 minutes after sunset and was recorded crossing an open field. There is woodland to the east of this location and a hedge/tree line to the south. There are farm buildings in the vicinity, but further afield;**
- **T62-T63 the first bat of the *Pipistrellus* genus was recorded less than 30 minutes after sunset. There are two farm buildings in proximity to the location where the first bat was recorded which may support a roost; and,**
- **T80-T83 the first bat of the *Pipistrellus* genus was recorded 33 minutes after sunset in the area of proposed Tower 81. There is a line of trees to the west of the Proposed Development which will not be affected by the works that may support a roost.**

During 2015, the activity survey also did not identify any mass movement of commuting bats, which indicates the absence of a major roost adjacent to the Proposed Developments. The results from the areas identified in 2013 and resurveyed in 2015, area presented as follows:

- **T1- T2 the first Leisler's Bat was recorded 17mins after sunset. It was again considered that the farm buildings in the vicinity may support a roost;**
- **T12- 13 the first common pipistrelle was recorded 20 minutes after sunset and was recorded crossing an open field. There is a hedge/tree line to the south of this location. There are farm buildings in the vicinity, but these are part of the larger landscape and not adjacent or within the transect location;**
- **T62-T63 the first bat (*Pipistrellus* genus) was recorded less than 30 minutes after sunset. There are two farm buildings in proximity to the location where the first bat was recorded which may support a roost; and,**
- **There is still evidence to support the likelihood of a Leisler's bat roost adjacent to the substation site, as Leisler's bats were first recorded 17 minutes after sunset in July and 26 minutes after sunset in September.**

T14 and T15 were not accessed during the 2015 survey. The emergence time for the first bat on the T12- T13 transect in July was 8 minutes (Leisler's bat). During the September survey, the emergence time of a common pipistrelle was 27 minutes after sunset. Both these results would indicate there are roosting opportunities for both species close to the site.

At T62-T63, the first bat heard during the July survey was a Leisler's bat heard commuting 13 minutes after sunset and a common pipistrelle heard commuting 31 minutes after sunset. The potential location of the Leisler's bat roost is in the tree line which bounded the access track onto the site. The area where the common pipistrelle was heard is close to this area also and this may be a roost location. Due to the tree line location adjacent to the access track, it will not be trimmed as a result of the Proposed Development.

In addition to the areas identified in 2013, further areas were identified during the surveys in 2015:

- **T3- T4 the first Leisler's bat was recorded 25 mins after sunset;**
- **T20, T23-T25, the first common pipistrelle was heard 20 minutes after sunset;**
- **T48, the first bat heard was a common pipistrelle, 45 minutes after sunset;**
- **T49-T51, the first Leisler's bat was heard 21 minutes after sunset and a common pipistrelle was heard 30 minutes after sunset;**
- **T64, the first bat heard on 24 July 2015 was a Leisler's bat heard commuting at 10 minutes after sunset and on the 14 September 2015, common pipistrelle heard commuting 31 minutes after sunset.**

T3-T4 are within the vicinity of the substation site and as such, the Leisler's bats heard commuting 25 minutes after sunset may have originated from the Leisler's bat roost to the west of the substation.

T20, T23-T25 was identified as having a roost adjacent to the access track which leads to T20.

T48, the first bat heard commuting was a common pipistrelle, which was along the transect, so it may have been commuting from its roost to a foraging area.

T49-T51, the first bat heard was a Leisler's bat, 10 minutes after sunset, along a tree line on the transect. A common pipistrelle was heard commuting 30 minutes after sunset, along the same tree line on the transect.

T64, on the 24 July 2015, a Leisler's bat was heard commuting at 10 minutes after sunset, it was heard at a listening stop in a tree line. On the 14 September 2015, a common pipistrelle was seen flying around a tree line, 31 minutes after sunset.

4.3 Commuting and Foraging Routes

Activity surveys were completed on 28 tower locations and the access tracks associated with them. In addition to the tower locations, the commuting and foraging routes around the tower locations and access tracks were also surveyed. For the majority of the locations surveyed, the dominant habitat was improved or poor semi improved grassland and the dominant field boundary type was species poor hedgerow or species poor hedgerow with trees.

The Proposed Development is approximately 34km long but the working area for each of the tower locations is 35mx35m and placed away from field boundaries where practicable. Field boundaries are important to the bat population along the route of the Proposed Development, because they are the linear features which bat use to commute around the site.

Equally, existing foraging habitat and as part of the 2013 surveys, "foraging hotspots" were identified. The foraging hotspots were identified in the following locations:

- **Substation- foraging Leisler's bats were recorded here;**
- **T1 - T4 - the hotspots were located around the farm buildings;**
- **T10 - T11 - the hotspots were focussed along the hedges, roads and at a barn/shed;**
- **T28 – T29, T30 - the hotspots included the orchard and area adjacent to the orchard;**
- **T41 - the hotspots included the hedges, roads and close to Tullysaran House;**
- **T45 - the hotpots included a large garden tree and hedge lined road;**
- **T47 - T49 - the hotspots included the farmyard;**
- **T58 - T61 - the hotspots included the hedge line to the north of T60, hedge line by Laneway, the access road and hedge line south of T60;**
- **T62 - T63 - the hotspots included the farmyard west, the lane and the hedge lines;**
- **T80 – T83 - the hotspots were located north of proposed Tower 81, the hedge northwest of proposed Tower 81 and the Drumhillery Road;**
- **T97 - T98 - the hotspots area were located along the hedge lines and tracks in proximity to proposed Tower T97 and T98; and,**
- **T100 - T101 - the hotspots included a hedge line by marshy ground between T100 and T101 and other hedge lines in the vicinity.**

Of this list of 12 "foraging hotspot" locations, seven were not accessed during the 2015 survey, however the following results were recorded in 2015:

- **Substation - foraging Leisler's bats were recorded;**
- **T1 - T4 - the constant activity recorded around the farm buildings but not dominated by foraging;**
- **T10 -T11 - the activity focused along the hedges, roads and at a barn/shed but not dominated by foraging;**

- **T58 -T61 - the activity focused on linear features including the hedge line to the north of Tower 60, hedge line by laneway, the access road and hedge line south T60; and,**
- **T62 - T63 - the activity focused on the farmyard west, the lane and the hedge lines.**

These five locations (like the rest of the activity surveys completed) did not replicate the high level of foraging activity which had been identified in 2013. In all surveys some foraging was recorded but it was not prolonged. The foraging recorded during the surveys is characteristic of bats hunting as they moved across the site, rather than gathering in one place to feed.

A total of 551 bats were recorded during the 2015 surveys with common pipistrelle bats being the species with the highest number of bats recorded (237) and soprano pipistrelles being the species with the second highest number of bats recorded (152). Natterers bat and brown long eared bat were recorded just once each.

The highest number of bats recorded during any one survey was common pipistrelle, with two surveys (T20, T23, T24 and T25 on 29/07/2015 and T64 on 14/09/2015) both recording 21 individual common pipistrelles.

The species with the highest Bat Activity Index was common pipistrelle (10.5) recorded on the surveys for T20, T23, T24 and T25 on 29/07/2015 and T64 on 14/09/2015. Soprano pipistrelle recorded the second highest BAI (9.5 per hour) during a survey of T61 on 14/09/2015. Natterers bat and Brown long eared bat recorded the lowest due to the small numbers recorded.

The survey with the most bat activity per hour was the survey of T61 on the 14/09/2015 (19.5 bats per hour). This result may have been because there were quite high numbers of soprano and common pipistrelles (19 and 13 bats and bat passes respectively) and seven Leisler's bats. T61 are bounded by a stream which flows to the west of the tower location and there are established hedges which connect the transect to the wider area. T61 is also approached by a laneway which is bounded by hedges and occasional trees. All of this makes the transect which T61 is within very well connected to the wider environment providing commuting routes to the greater landscape.

In July 2015, T62 - T63 and T64 had the highest number of bats and bat activity (41 bats recorded on each transect on 24/07/2015). Due to the proximity of the transects, there may be some double counting. In September 2015, T3-T4 had the highest number of bat (46) and the highest amount of bat activity. In September 2015, T62-T63 had 12 bats recorded and T64 had 36 bat recorded. Both these results were recorded on 14/09/2015.

In 2013 T28-T30 had the largest number of bats recorded during any one survey (55 on 27/06/2013). In 2012 T78 and T63 had the highest amount of bat activity and in 2009 T6 had the highest amount of bat passes with 242. In 2013, there were three instances when no bats were recorded on a survey. On 22/05/2015 a survey of T13 – T14 did not return any results. On 05/06/2015 a survey of T4, T5, T6 and T7 did not record any results and on 25/07/2015, a survey of T5 did not record any results.

4.3.1 Specific Location Activity Survey Discussion

The following section is a brief discussion of the results that were collected in July and September 2015. The discussion has been split into each individual area surveyed, beginning at the northern end of the Proposed Development and going south, towards T64 (the most southerly tower location surveyed in 2015).

4.3.1.1 Substation

For both surveys in 2015, the first and last bats heard were Leisler's bats. There was more activity during July survey but both surveys presented a range of species of bat. The July survey had a Natterers bat recorded at the junction of Trewmount Road and the September survey recorded a Nathusius' pipistrelle at a listening stop on the eastern side of the site. Based on the emergence time of the Natterers bat (45 minutes to 1 hour after sunset) and the time the bat was heard (1 hour and 5 minutes after sunset), there may be a Natterers roost near to the site. In addition to a Natterers roost, there may also be a Leisler's bat

roost in the farm to the west of the Proposed Development site as on both occasions; Leisler's bats were heard 17 and 26 minutes after sunset respectively.

The Proposed Development may cause disruption to flight lines across the site. Planting as a result of the Proposed Development should create new flight lines and foraging areas across the site. There may be an individual Natterers roost affected as a result of the Proposed Development, but this has not been identified. However if a roost location is identified, the mitigation proposed for other roost locations on the substation site will be used and the standard habitat compensation which has been proposed as part of the 2013 bat report will be used.

4.3.1.2 T3 – T4

On neither survey was the proposed location of T3 accessed in 2015, but hedge lines around the field containing T3 were surveyed. There was more activity during the July survey, than during the September survey. The September survey was more species diverse because of the Nathusius' pipistrelle heard. On both 2015 surveys, the first bat heard was a Leisler's bat, 28 minutes and 20 minutes after sunset respectively. Overall, more Leisler's bats were heard during the September survey but this may have been because of the types of technology[7] used to record each survey. There will be no impact to the bat population as a result of the Proposed Development. There will be no changes to access arrangements onto the site because of the Proposed Development.

4.3.1.3 T8 – T10

During the September 2015 survey T10 was not accessed because of livestock. On both the 2015 surveys, the transect route differed from the transect route which had been completed in 2013. The July 2015 survey was marginally more species diverse, as soprano pipistrelles were heard in addition to common pipistrelles and Leisler's bats. There were marginally more bats heard during the July survey (17 bats and bat passes) compared to the September survey (13 bats and bat passes). The surveys began in two different places to illustrate how the site is used by bats at different times of their activity period (2 hours after sunset).

4.3.1.4 T12 – T13

The 2015 surveys for T12 and T13 are an amended version of the 2013 transect routes as the 2013 transect routes were amalgamated into one route. Both 2015 surveys recorded common and soprano pipistrelles, Leisler's bat and bats of the *Myotis* genus. Both surveys recorded similar numbers of bats (the July survey recorded 36 bats and bat passes and the September survey recorded 35 bats and bat passes). On both survey occasions, bats were heard across the site.

4.3.1.5 T20, T23, T24 and T25

In 2013, the surveys of T20 and T23 were completed using a separate transect to the T24 and T25 transect. For the July 2015 survey, these transects were completed together on the same night. In September 2015, the surveys completed in September 2015 in two sections, on the 16/09/2015 and on the 28/09/2015. The survey on the 29/07/2015 identified Nathusius' pipistrelle using the river location to the south of T23. In the tree line to the north of the river, there is a commuting area and along the lane way to the west of the access track for T20, there is another commuting route. In a granny flat/agricultural building adjacent to the laneway which will not be affected by the Proposed Development, a bat roost for 6 soprano pipistrelles was identified. During the July survey, activity was confined to the northern and central parts of the transect, however the 28th September survey identified bat use in the southern part of the site.

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[7] Different detecting technologies can be used on different surveys to improve the robustness of the surveys. All detection technologies used during the surveys were appropriate for professional surveys.

4.3.1.6 T48

The surveys completed for T48 did not follow the 2013 transect route because of issues associated with land access. Both surveys in 2015 recorded the same species of bats (common and soprano pipistrelles and Leisler's bats) but the survey in July recorded more bats and bat passes (22 opposed to 14 bats and bat passes in September). During the July survey, there was more foraging activity identified than in September but this was generally found around the site. Bats were only heard and recorded during the survey, they were not seen.

4.3.1.7 T49, T50, T51

The surveys completed in 2015 were amended because of land access issues from the transect route surveyed in 2013. In July, one surveyor completed transects but part of it to the north of T50 could not be completed because of livestock issues. When the survey was completed in September, it was completed by two surveyors who started at the most northern end and southern end of the transect. The results collected were amalgamated to give total transect coverage. During the July survey, a total of six bats and bat passes were recorded and during the September survey, the amalgamated survey, recorded a total of 26 bats and bat passes. The bats heard in July were confined to tree lines and the bats heard in September were spread more across the transect and associated field boundaries.

4.3.1.8 T59-T60

The transect route completed in 2015 was largely the same as that used in 2013. For the July 2015 survey, the transect route was slightly amended because of issues associated with livestock. During the September 2015 survey, the 2013 transect route was completed unamended. The July 2015 survey recorded 25 bats and bat passes and the September 2015 survey recorded 22 bats. The July 2015 survey recorded common and soprano pipistrelles, Leisler's bats and a bat of the *Pipistrellus* genus. The September 2015 survey recorded common and soprano pipistrelles, Leisler's bats and two unidentified bats. On both occasions bats were seen emerging from the tree line. During the July 2015 survey, a common pipistrelle was seen emerging from a previously identified (2013) tree roost. During the September 2015 survey, a soprano pipistrelle was seen emerging from an ash tree to the south of the aforementioned tree roost identified in 2013. The September 2015 survey also recorded an unidentified bat making social calls along the tree line. The purpose of these calls could be to mark territory.

4.3.1.9 T61

The transect completed in 2013 was repeated in 2015 for the September survey. However, during the July 2015 survey, the northern part of the transect could not be accessed because of land access issues. During both 2015 surveys, the same species of bat were identified (common and soprano pipistrelles and Leisler's bats). The July 2015 survey recorded less bat and bat passes then the September 2015 survey (23 bats and bat passes opposed to 39 bats and bat passes). In addition to recording less numbers of bats and bat passes, the first bat encountered during the July survey was recorded 51 minutes after sunset opposed to 15 minutes after sunset in September. The reason for this may relate to how the transect was completed between July and September, whereby the amendments to the transect route moved the surveyor away from more used flight lines.

4.3.1.10 T62, T63

The 2015 survey was completed in line with the 2013 transect route, however during both the 2015 July and September surveys part of the transect could not be accessed because of livestock issues. During the September survey, there was heavy rain during the middle of the survey period but the rain passed and the survey continued. The September survey was more species diverse then the July survey. During the July survey, the species recorded were common and soprano pipistrelles and Leisler's bats (total 41 bats and bat passes recorded). During the September survey, in addition to the species recorded during the July surveys and a bat of the *Pipistrellus* genus, a brown long eared bat and an unidentified bat (Total 12

bats and bat passes recorded). The unidentified bat was recorded making a social call. At the beginning of the transect during the July survey 3 Leisler's bats were seen foraging and there was quite a high amount of Leisler's bat activity for the rest of the survey. The first Leisler's bat was seen 13 minutes after sunset and flew from the direction of the proposed access road in the vicinity. There may be a roost in the vicinity of the access road but this will not be affected as a result of the Proposed Development because no tree cutting is proposed along the access roads.

4.3.1.11 T64

The transect route identified in 2013 was followed in both 2015 surveys. During the September 2015 survey, there was a rain shower in the middle of the survey period but this did not appear to affect the results. The survey during July 2015 identified common and soprano pipistrelles and Leisler's bat (29 bats and bat passes in total). The September survey, in addition to the species identified in July also encountered a bat of the *Myotis* genus (36 bats and bat passes in total). As a result, the September 2015 survey is slightly more species diverse. The majority of the bats encountered during the July 2015 survey were seen and flight lines were recorded but during the September 2015 survey the bats were heard only.

4.3.2 Total Numbers of Bats Identified Discussion

Between 2013 and 2015, results have been presented in a similar manner to aid inter-year comparison. There are some differences between the 2013 data and the 2015 data, which require exploration. In 2013, access to the Proposed Development bat transect routes was 75.5%. In 2015, access was reduced to 30%.

The majority of transects completed differ from those previously completed in 2013. The two reasons for this are:

- **Land access was not available and the transect had to be amended, or,**
- **The surveyor on site encountered a difficulty which resulted in the transect being amended.**

Surveyor difficulty was generally because either there was no gap in the field boundary allowing access into the field or there were dangerous livestock in the field and the surveyor could not enter without breaching Health and Safety guidance.

Table 10 shows how the range of species encountered in 2015, compares to those encountered in 2013, 2012, 2011 and 2010/2009.

Capabilities on project:
Environment

Table 10: Range of species encountered.

Species recorded in 2015	Species recorded in 2013	Species recorded in 2012	Species recorded in 2011	Species recorded in 2010/2009
Common pipistrelle	Common pipistrelle	Common pipistrelle	Common pipistrelle	Common pipistrelle
soprano pipistrelle	soprano pipistrelle	Soprano pipistrelle	Soprano pipistrelle	Soprano pipistrelle
Leisler's Bat	Leisler's Bat	Leisler's bat	Leisler's bat	Leisler's bat
Unidentified bats of the *Myotis* genus	Unidentified bats of the *Myotis* genus	Unidentified bats of the *Myotis* genus		Unidentified bats of the *Myotis* genus
Nathusius' pipistrelle	Nathusius' pipistrelle	Nathusius' pipistrelle		Nathusius' pipistrelle
whiskered bat		whiskered bat		whiskered bat
Natterer's bat		Natterer's bat		Natterer's bat
Brown long-eared bat				Brown long eared bat
Unidentified bats of the *Pipistrellus* genus	Unidentified bats of the *Pipistrellus* genus	Unidentified bats of the *Pipistrellus* genus	Unidentified bats of the *Pipistrellus* genus	Unidentified bats of the *Pipistrellus* genus
				Daubenton's bat

There are a number of potential reasons for the differences in range of species recorded across the years. Surveys in 2011 were car based thus, the species identified where those which concentrate on commuting and foraging on linear features or are high flying resulting in those types of bat being encountered over other species. In 2013 bats of the *Myotis* genus were not identified to species level.

The BAI in 2013 was 6.42 and in 2015 the BAI was 10.07. In 2013, there were more bats and bat passes recorded (708), in comparison to 2015 (551 bats and bat passes). However the reason for the difference in individual bat and bat pass numbers will relate to more transects having been completed in 2013. Also, in 2013, there was no activity recorded on 22.05.2013, 05.06.2013 and 25.07.2013, where as in 2015, all activity surveys recorded bat activity. In addition, the activity surveys took place at different times of year, whereby in 2013, surveys were completed between May and July and in 2015, surveys were completed in July and September.

In 2015, two additional roosts were identified in the same areas (tree lines at the substation site and in proximity of T60) as roosts previously identified. The mitigation originally proposed in 2013 also applies to these roosts. It is accepted that roosts on the substation site will be removed, however the proposed planting and associated bat boxes will create bat habitat and compensate for loss. The roosts identified in the tree line to the east of T60 may be impacted because the trees will trimmed but not removed.

An additional roost was identified in 2015, in an agricultural building/granny flat to the east of the T20 access track, however it will not be impacted as a result of the proposed development.

Appendix D contains the original data which was presented in 2013 and the update to the data to take account of the transects which could not be accessed in 2015.

Capabilities on project:
Environment

5 Recommendations and Conclusion

5.1 Roosts

Based on the information collected in 2015, there are five roosts within the Proposed Development. Of these, three are historical and two were identified in 2015. Adjacent to the proposed development, there was an additional roost identified in 2015 which will not be affected by the proposed development. All roosts are considered transient and contained small numbers of bats.

Based on the current understanding of the Proposed Development and legislation protecting European protected species, an EPS licence for bats will be required.

All five features (four trees and a building) will be disturbed and an EPS licence must be in place before any enabling activities commence, to ensure work complies with local and European legislation.

The proposed construction period for the Proposed Development is three years, with ground works beginning a year in advance. This four year time period allows SONI to establish bat roost mitigation where necessary, establish if the mitigation is working and then remove or relocate the tree roosts if necessary. Removal of trees/buildings which may contain bat roosts will have to be conducted under the supervision of a licensed bat ecologist and / or their accredited agents.

A minimum of 100 bat boxes will be erected along the line route and substation, adjacent to those hedgerows where mature trees or trees with a dense covering of ivy have been lopped. This is precautionary compensation and enhancement as lack of available bat roosts can be a limiting factor in many populations. These boxes will be erected prior to the commencement of vegetation clearance to facilitate the construction of the Proposed Development. A range of bat box designs and sizes will be employed.

The use of artificial bat boxes will be monitored by a licensed bat worker as part of the post-construction monitoring programme. This will be a condition of the licence issued to destroy the known roosts.

5.2 Commuting and Foraging

The presumption should be to retain and protect suitable foraging/commuting habitat where practicable. This includes protection from direct damage/clearance, as well as protection from inappropriate intrusion from artificial lighting. There is one tower base area which is adjacent to a roost location and one roost which has been identified adjacent to an access route. The Proposed Development will not directly affect these areas. As a precaution good housekeeping and managed removal of vegetation must take place to maintain commuting routes and access to foraging for these areas. It is an offence to block the route of an EPS from its place of rest.

In general, the managed removal of vegetation will provide some linear commuting route mitigation until the proposed development is built and the surrounding landscape matures.

5.3 Conclusion

Bats are highly mobile species and it is not expected that the Proposed Development will result in a temporary or permanent negative effect on the bat population within or around the survey area. It is considered that the Proposed Development will not affect the bat population due to the minimal lengths of permanent hedge loss and the fact that the hedgerow network is already connected to the wider environment and there are alternative routes for bats to follow.

The Proposed Development will result in the removal of five confirmed roosts. Prior to the removal of the roosts, EPS licences will be required. However, mitigation has been proposed to enhance roosting opportunities.

Where linear features and roosts may be affected, they are in areas which were identified in 2013 and mitigation is already in place. There is no requirement for additional mitigation over and above, that prescribed previously.

Capabilities on project:
Environment

6 References

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Capabilities on project:
Environment

Appendix A – Survey Times and Weather Condition 2015

Capabilities on project:
Environment

Dusk Transect Surveys Times and Weather Conditions

Survey Date	Sunset/ Sunrise Times	Start Time	Finish Time	Weather Conditions						
				Temp (°C) Start	Cloud Cover (%) Start	Wind Speed (Beaufort average) Start	Temp (°C) Finish	Cloud Cover (%) Finish	Wind Speed (Beaufort average) Finish	Recent Rain? Other comments
22/07/2015	21:44	21:14	23:44	13	60	0.5	8	10	0	Brief rain at 22:00 for 10 minutes
24/07/2015	21:41	21:11	23:41	13	20	0	8	10	1	Slight gusts at first 30 minutes of survey
25/07/2015	21:39	21:09	23:39	16	60	0	10	10	0	
29/07/2015	21:30	21:30	23:30	11	50	1	8	100	0	
09/09/2015	20:00	19:30	22:07	16	5	0	16	5	0	
14/09/2015	19:17	19:47	21:47	13	100	1	13	100	1	Light rain between 20:29 and 20:35
15/09/2015	19:45	19:15	21:45	12	50	0	6.5	40	0	
16/09/2015	20:42	20:12	22:42	14	80	0	11	70	0	
28/09/2015	19:11	18:41	21:11	12	30	1	10	40	1	Few insects around, mist around stream, full moon

Emergence Survey Times and Weather Conditions 2015

Survey Date	Sunset/Sunrise Times	Start Time	Finish Time	Weather Conditions						
				Temp (°C) Start	Cloud Cover (%) Start	Wind Speed (Beaufort average) Start	Temp (°C) Finish	Cloud Cover (%) Finish	Wind Speed (Beaufort average) Finish	Recent Rain? Other comments
30/07/2015	21:30	21:00	23:30	12	100	0	8	100	0	
23/09/2015	19:24	18:54	20:55	12	90	1	10	50	1	Rain resulted in early finish at 20:55
24/09/2015	19:21	18:51	21:21	13	20	1	10	20	1	Light shower at 19:58 and a light breeze.

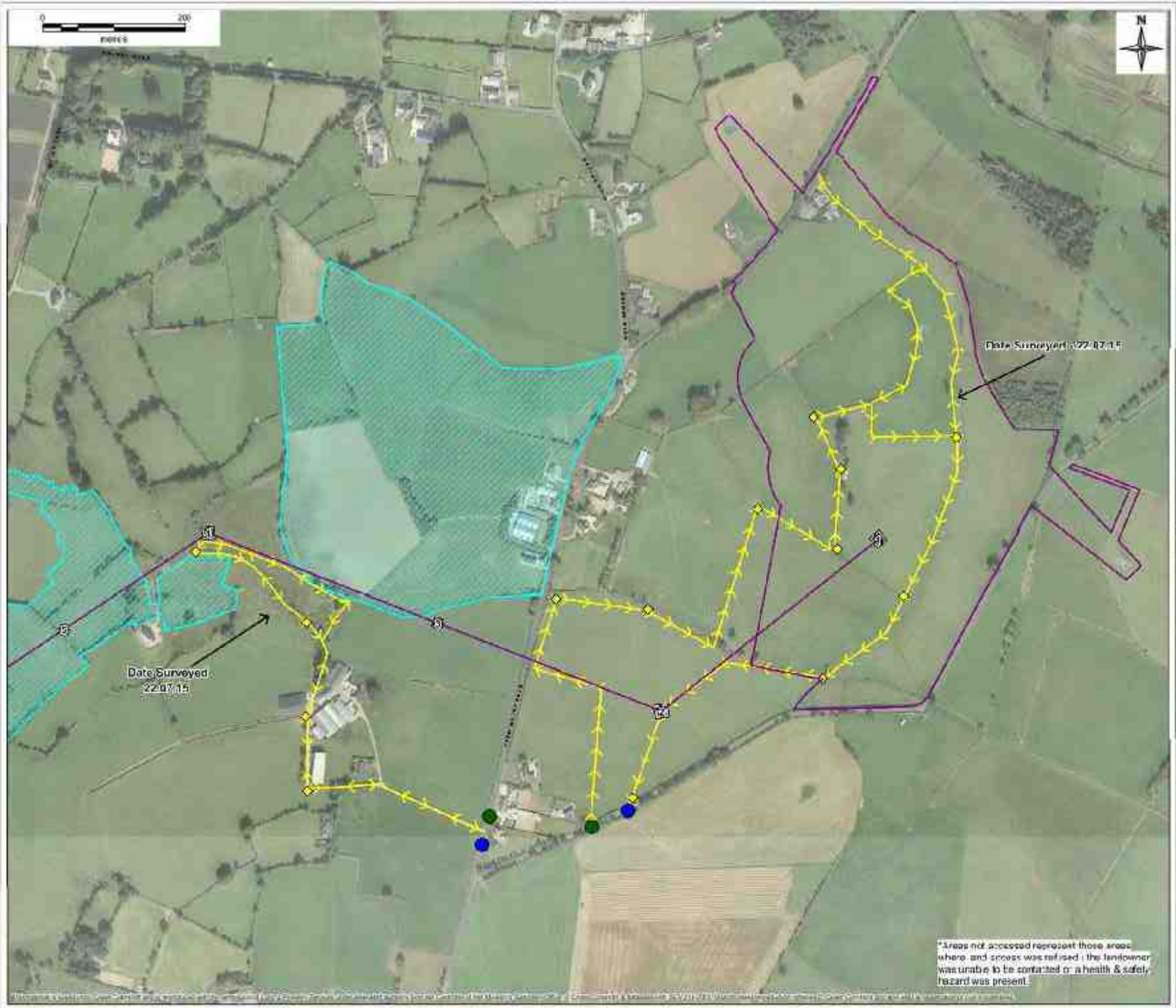
Capabilities on project:
Environment

Re-entry Survey Times and Weather Conditions 2015

Survey Date	Sunset / Sunrise Times	Start Time	Finish Time	Weather Conditions						
				Temp (°C) Start	Cloud Cover (%) Start	Wind Speed (Beaufort average) Start	Temp (°C) Finish	Cloud Cover (%) Finish	Wind Speed (Beaufort average) Finish	Recent Rain? Other comments
31/07/2015	05:35	03:35	05:30	8	100	0	9	80	0/1	Breeze began at 04:24 and dropped at 05:10.
24/09/2015	07:15	05:15	07:15	10	0	1	10	10	1	Gusts of wind at 07:12
25/09/2015	07:17	05:15	07:11	10	5	1	10	5	1	Light rain began at 05:17 and continued until 05:23. Very light spitting began at 05:23, which became heavier at 06:23

Capabilities on project:
Environment

Appendix B – Figures



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Substation Planning Application Boundary
- Transect Start Point
- Transect End Point
- Transect Coloring Stops
- Bat Transect Walked (recording direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELS / PL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

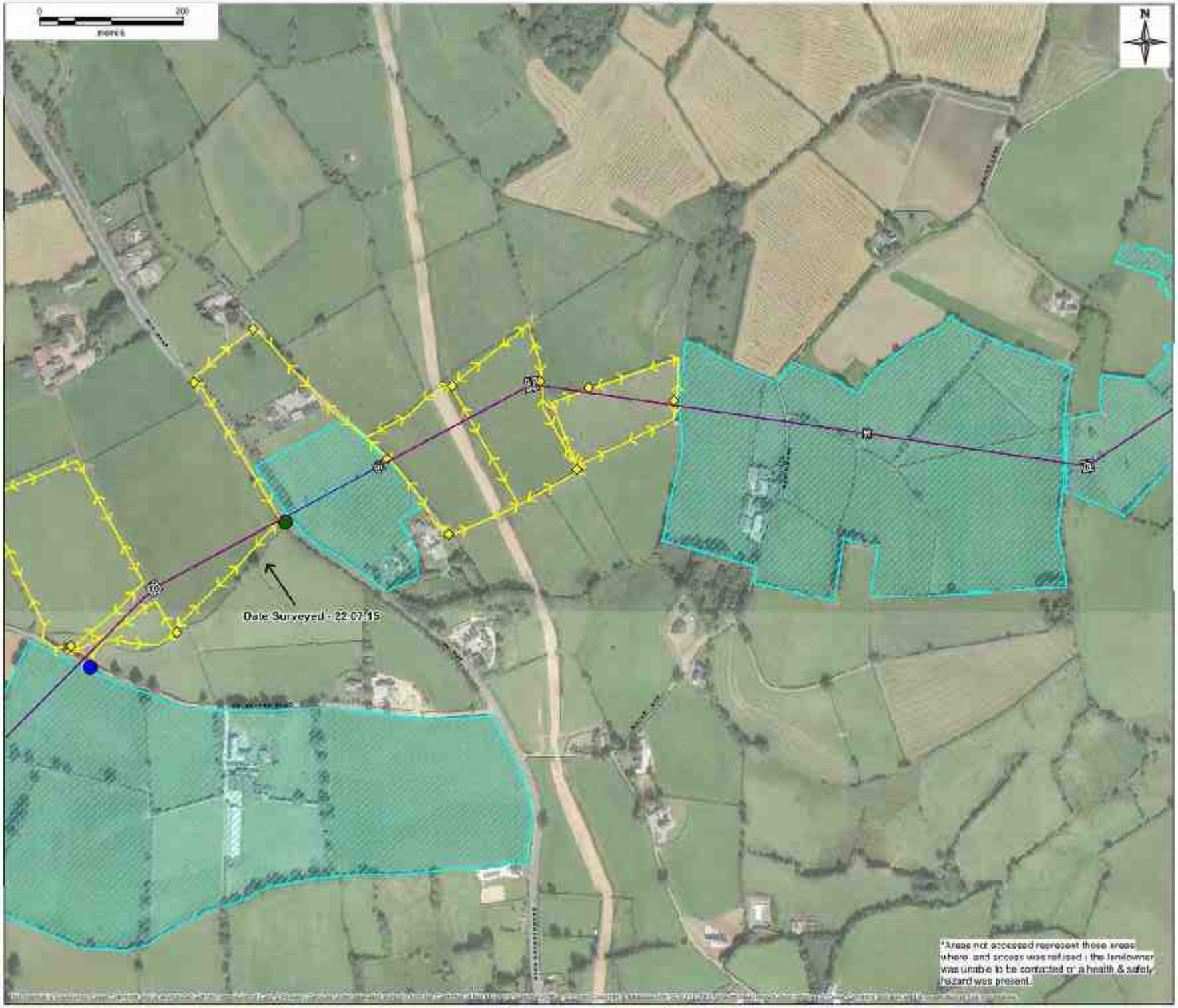
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1A



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
- Transect End Point
- Transect Listening Stops
- Bat Transect Walked (including direction of Land)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

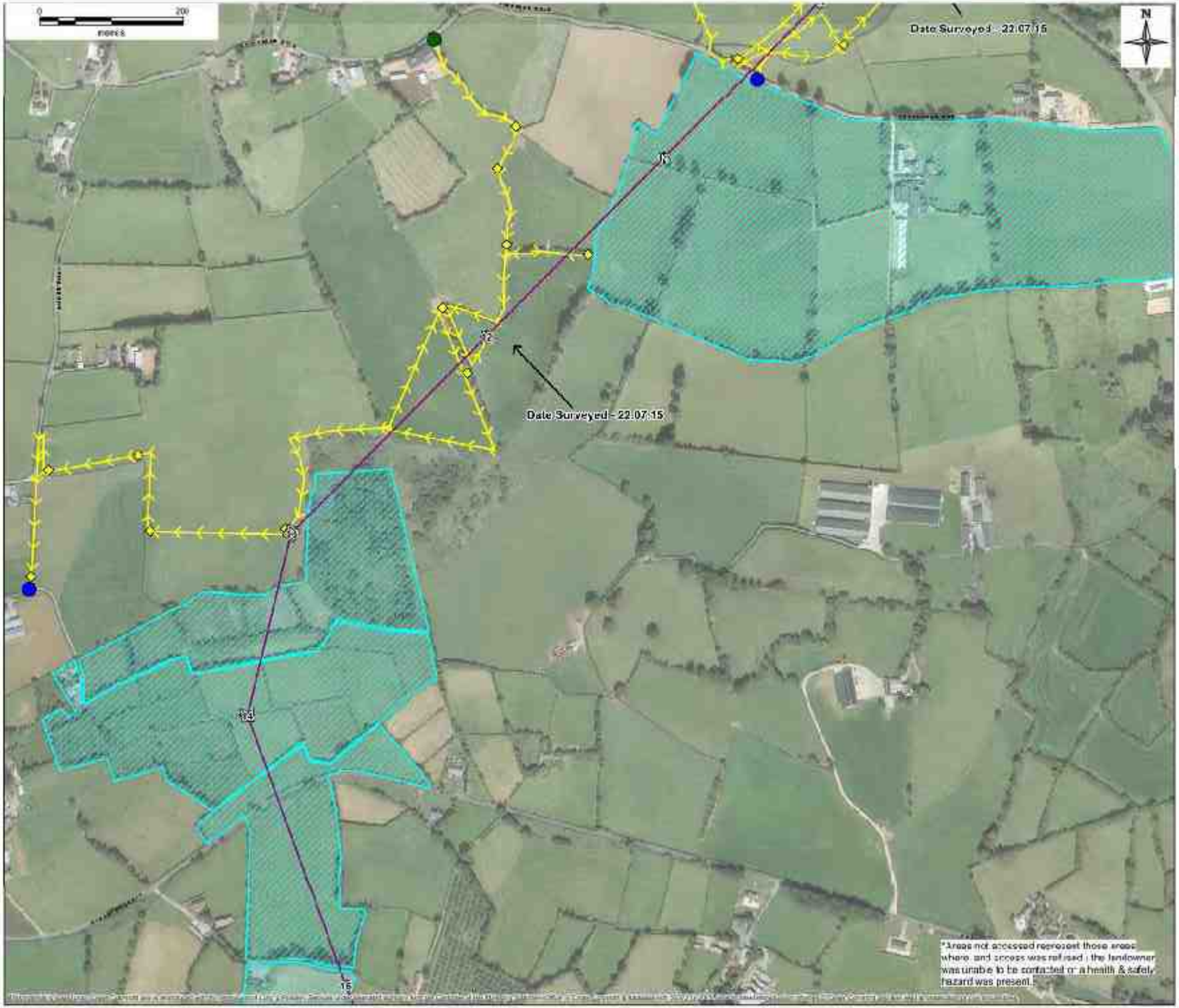
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/18



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
- Transect End Point
- Transect Listening Stops
- Bat Transect Walked (including direction of Land)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

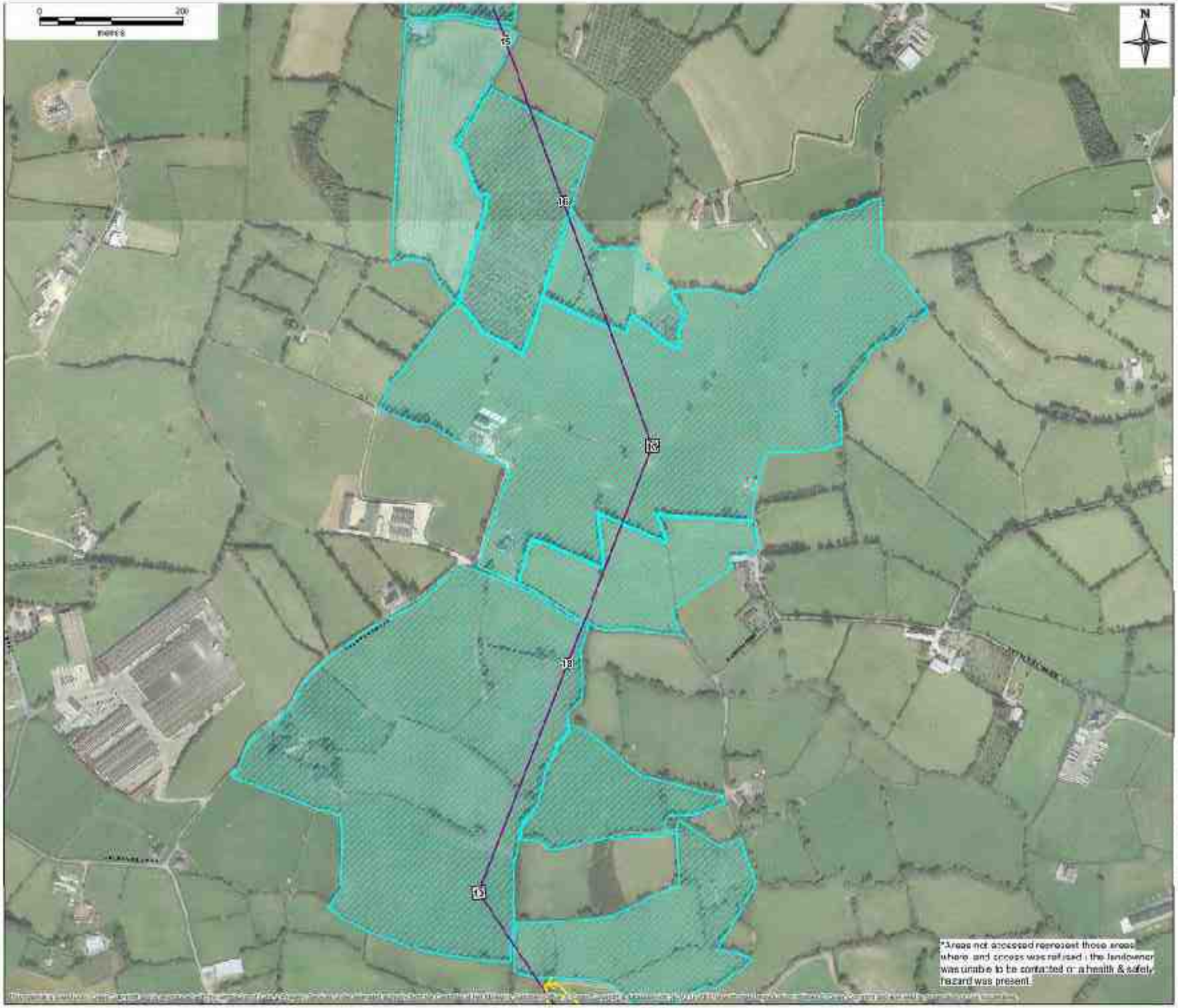
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1C



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
- Transect End Point
- Transect Listening Stops
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

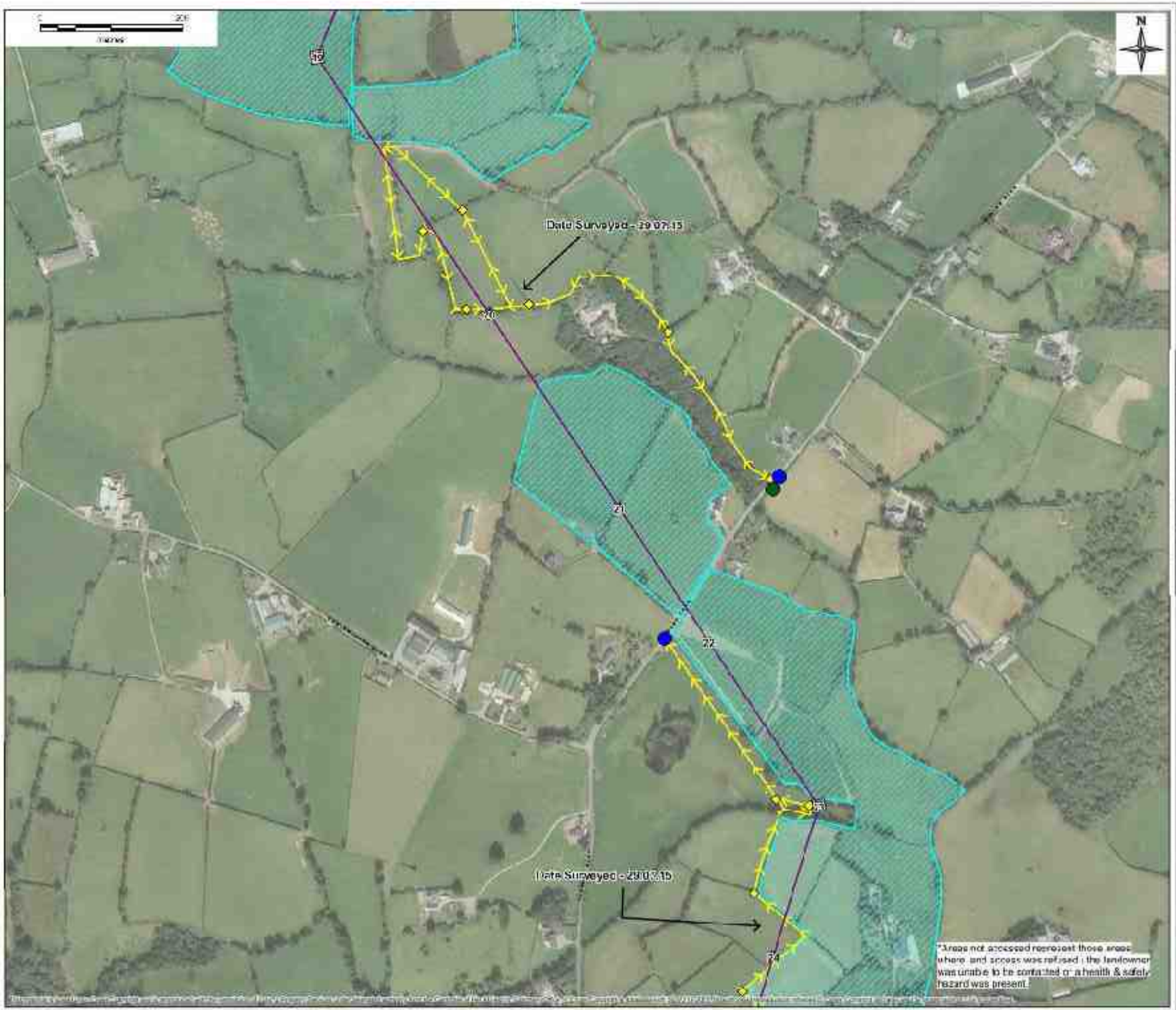
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/10



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
- Transect End Point
- Transect Listening Stops
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: EL3/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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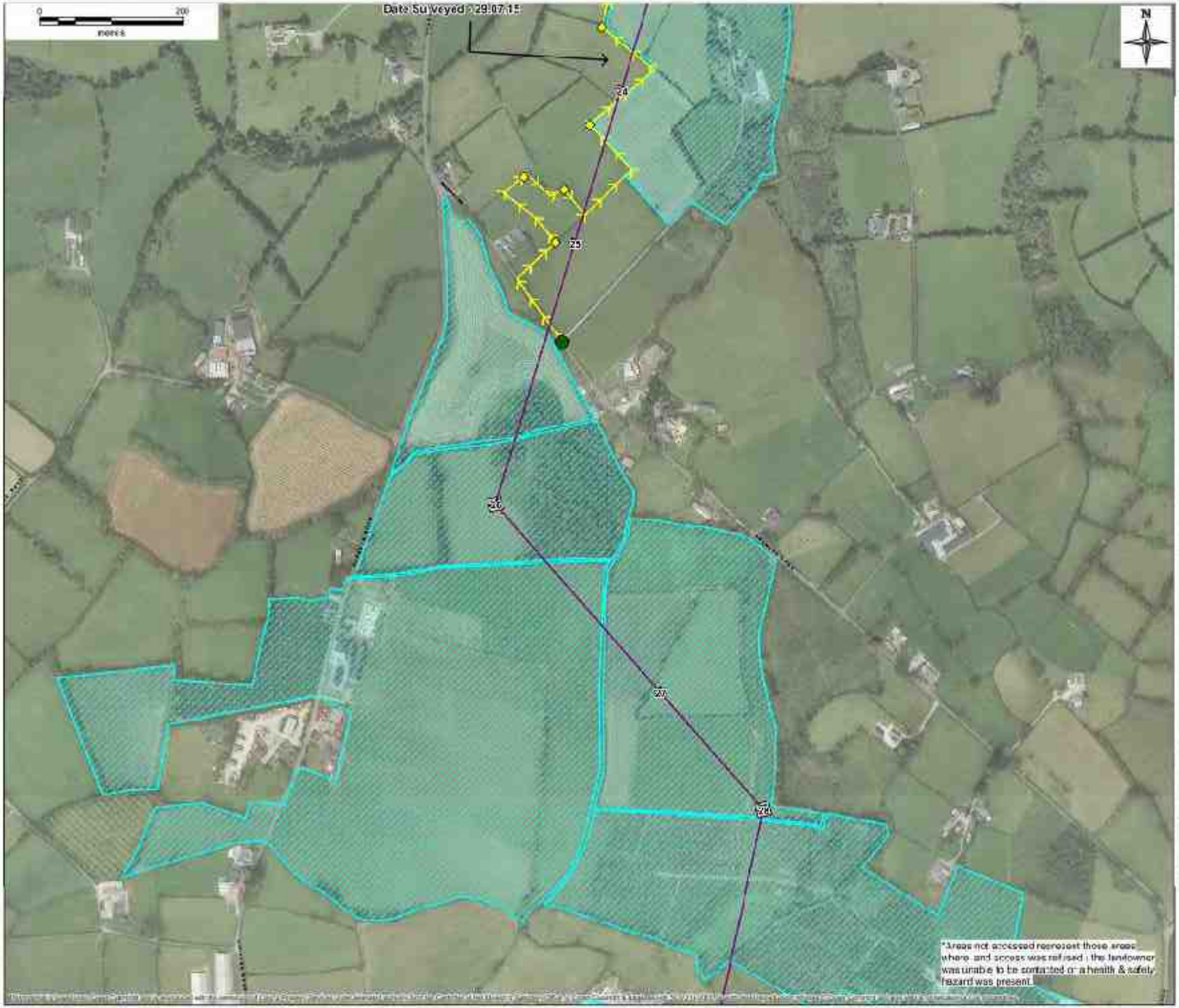


AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
- Transect End Point
- Transect Listening Stops
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

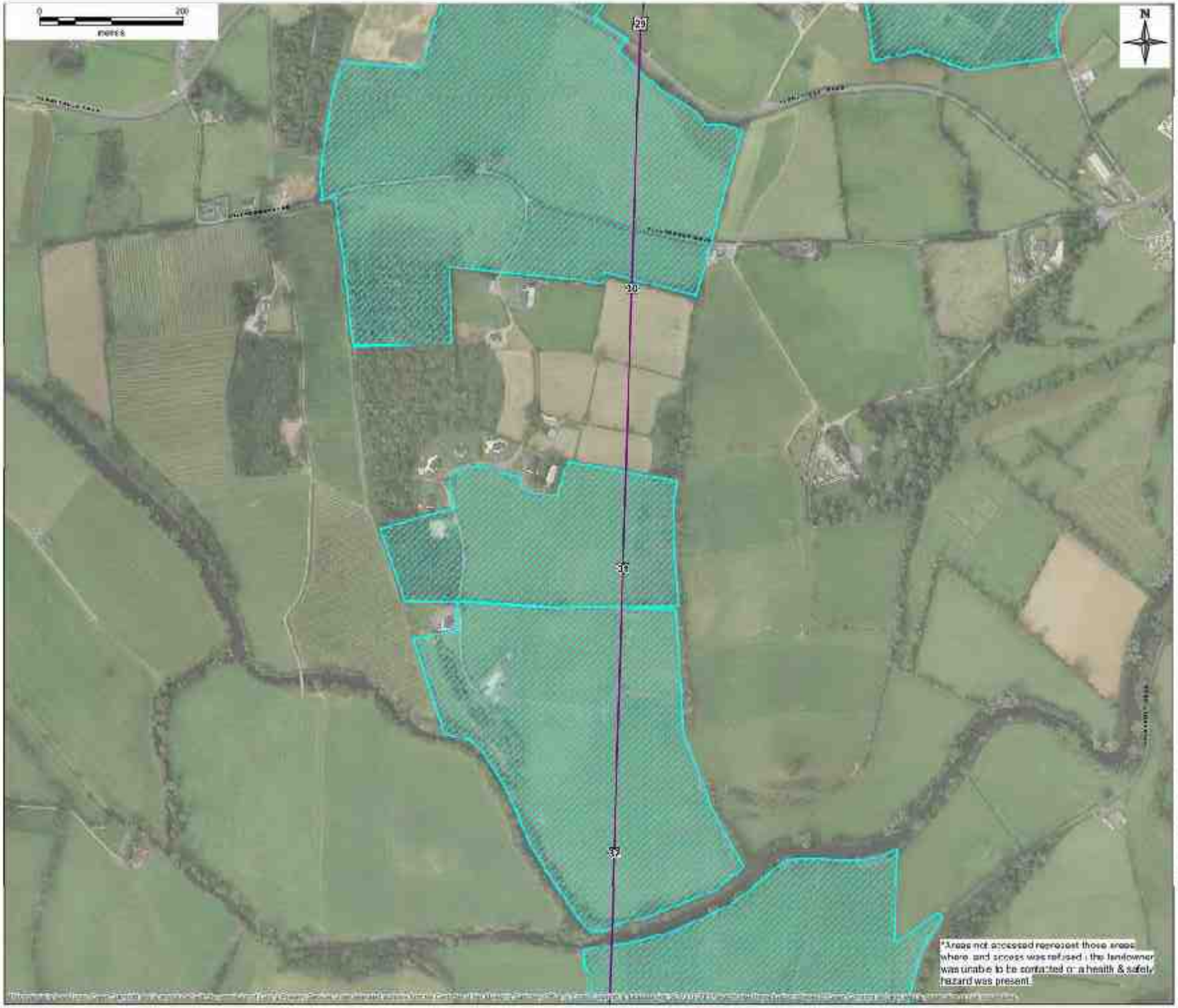
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1F



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
- Transect End Point
- Transect Listening Stops
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

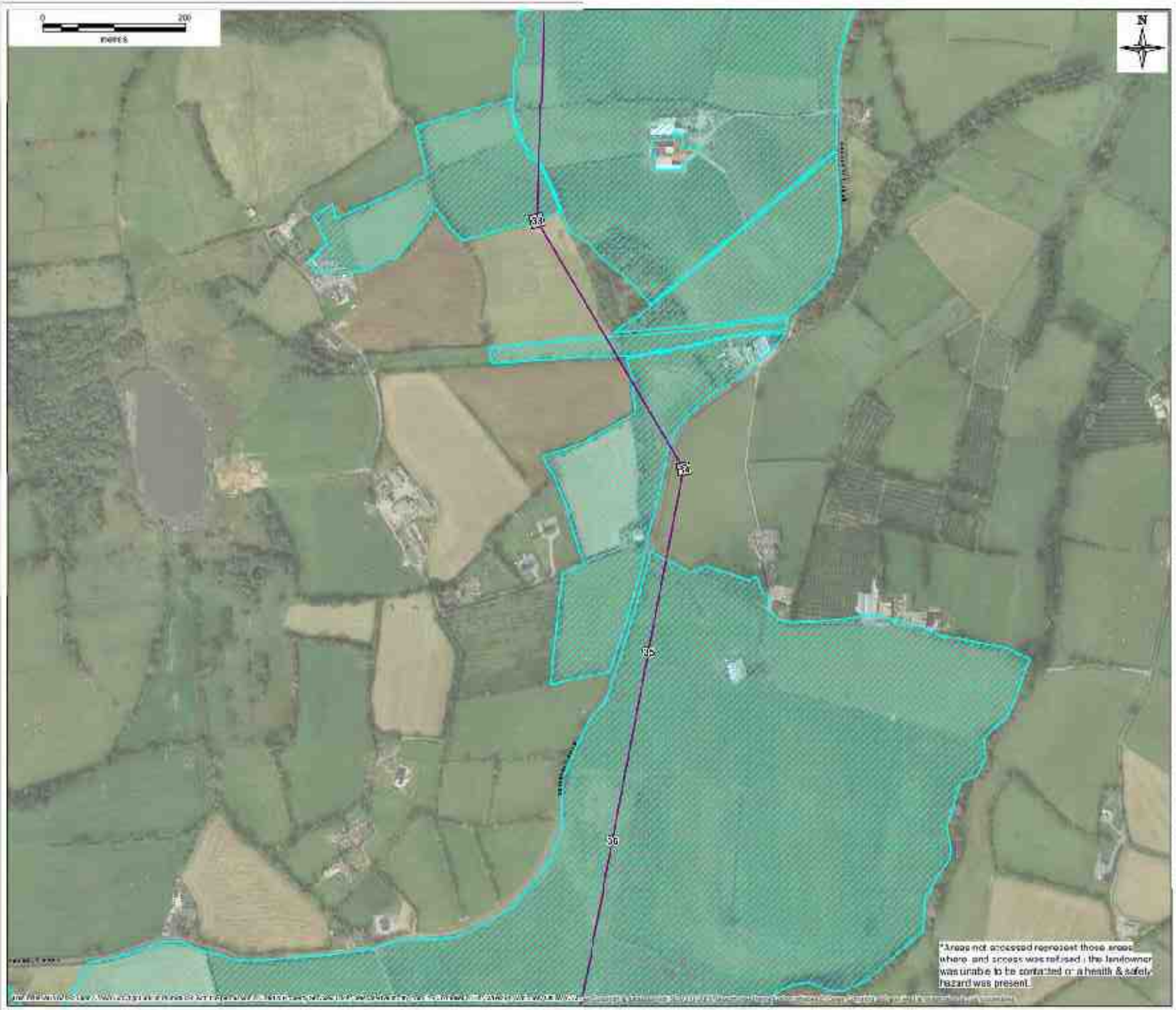
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1G



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

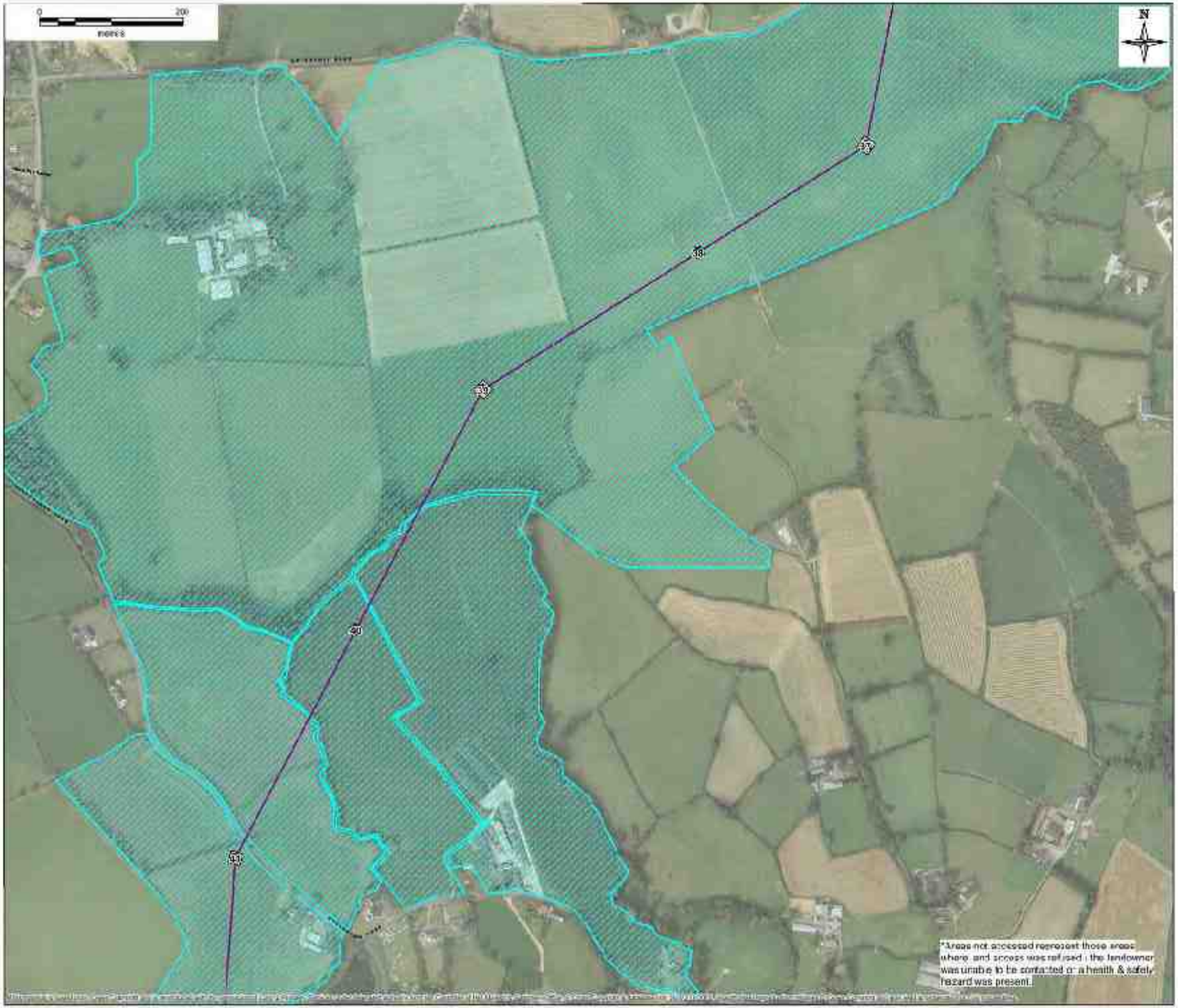
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1H



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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- Proposed Tower and Maximum Tower Foundation
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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

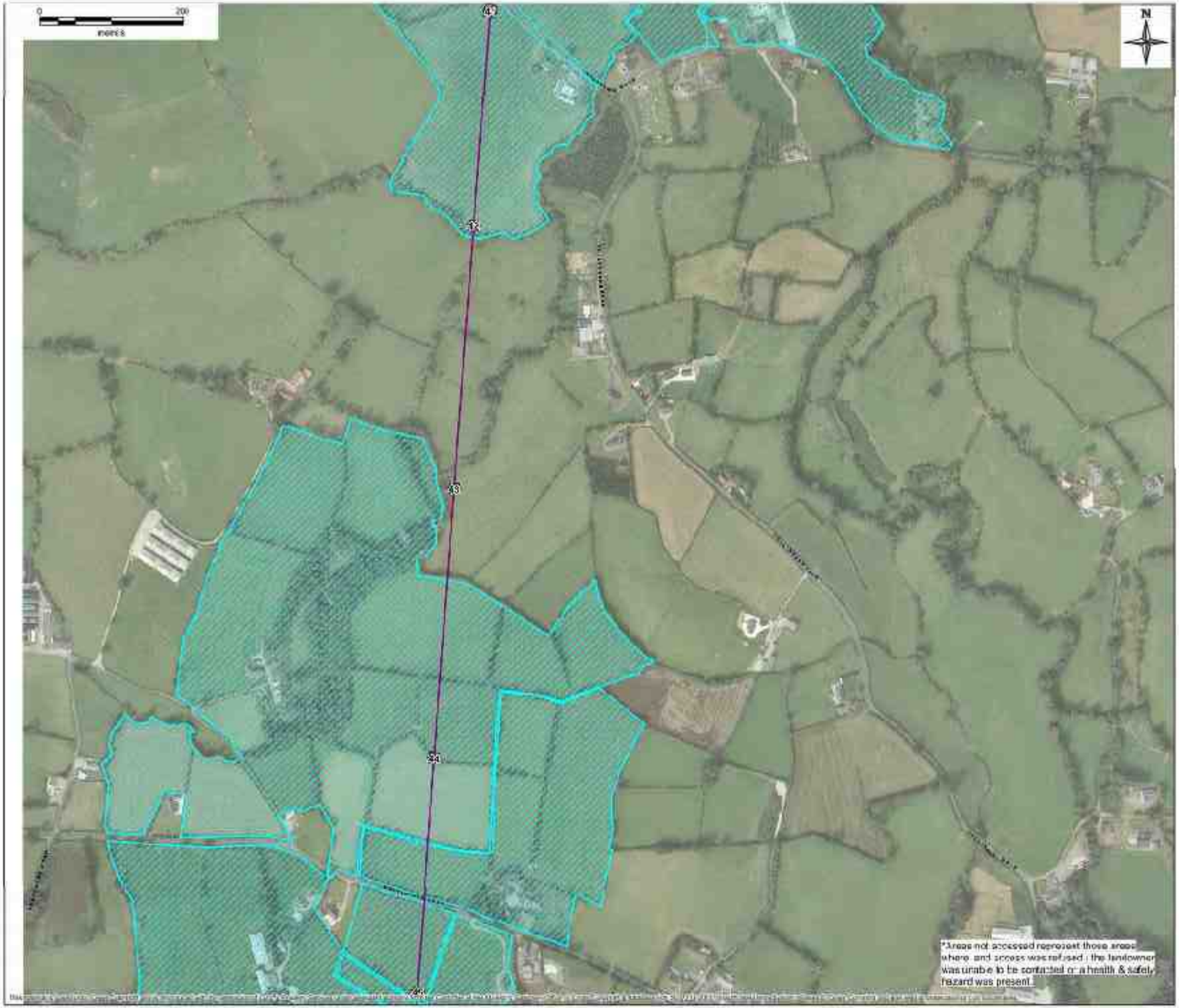
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/11



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
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- Transect Listening Stops
- Bat Transect Walked (including direction of Land)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

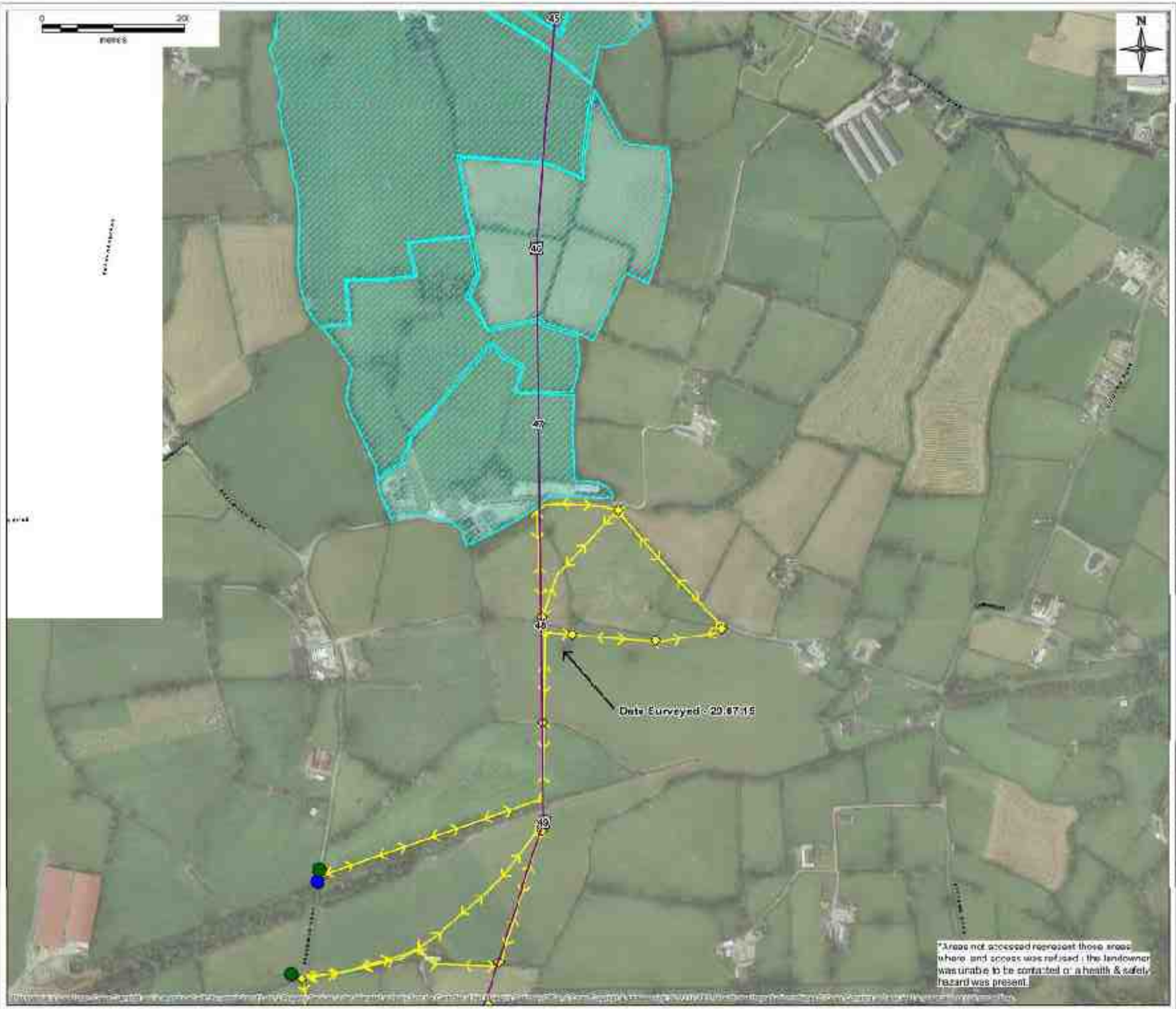
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Transect Start Point
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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: EL3/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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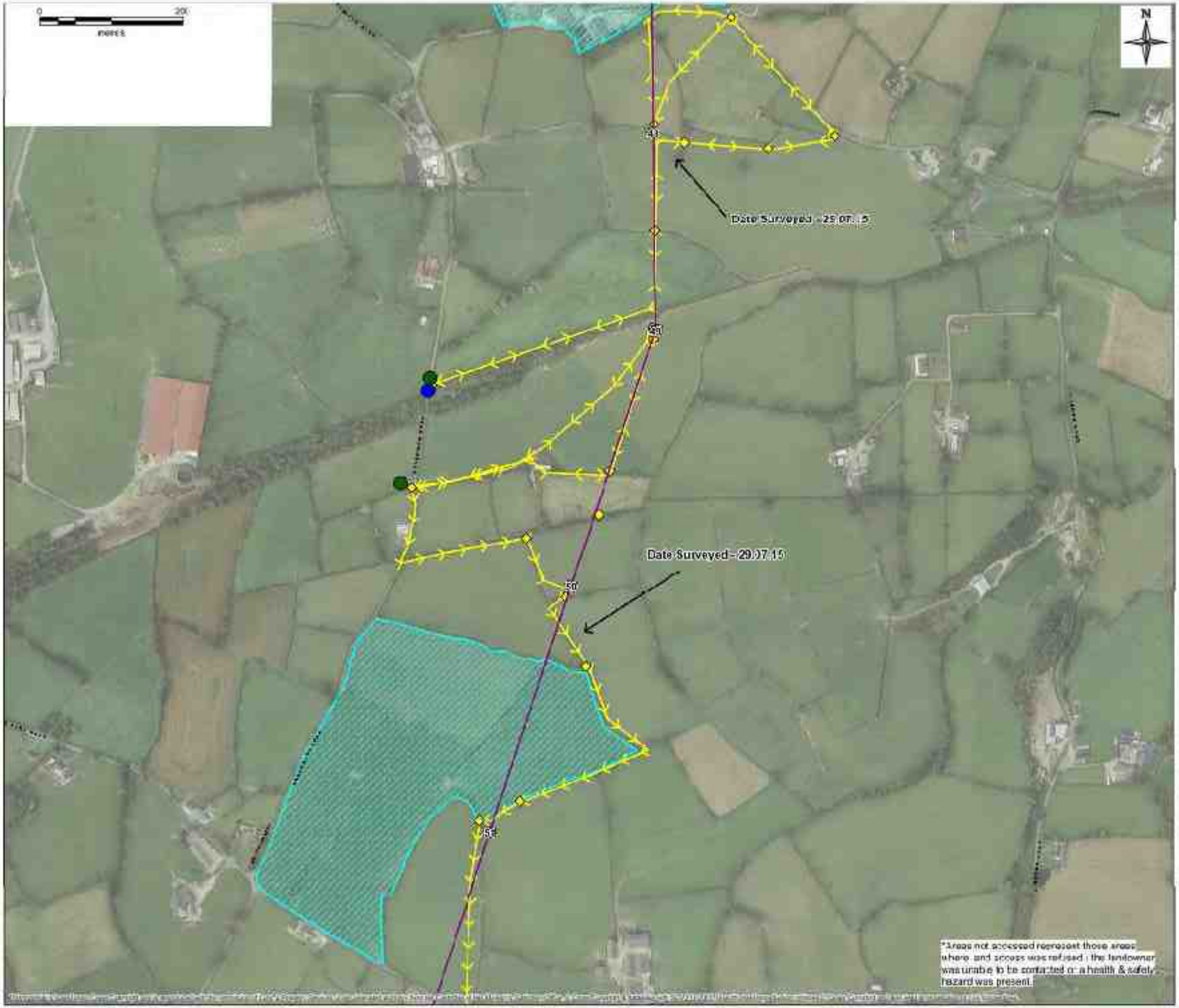
DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1K



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Substation Planning Application Boundary
- Transect Start Point
- Transect End Point
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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: EL3/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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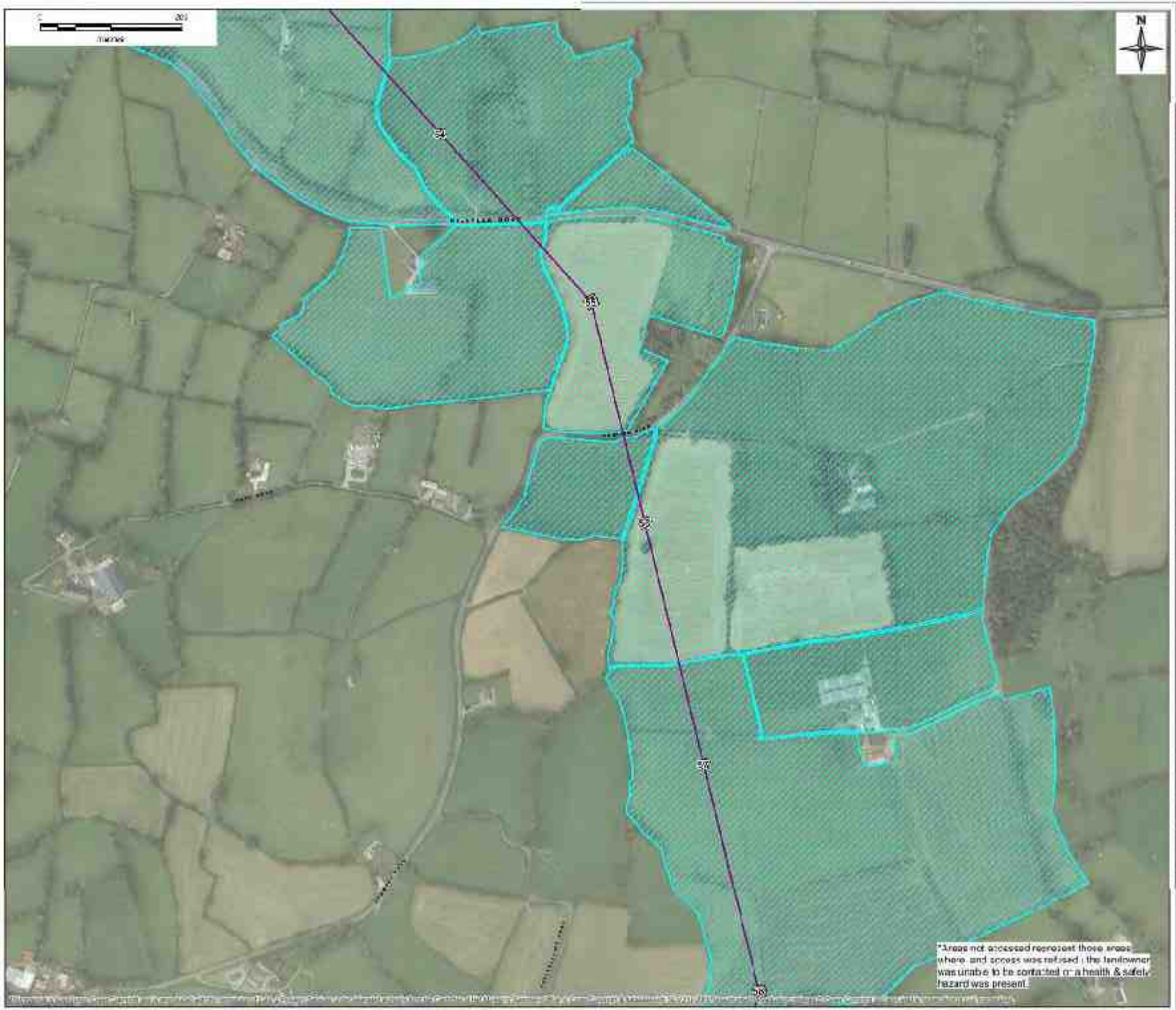
DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1L



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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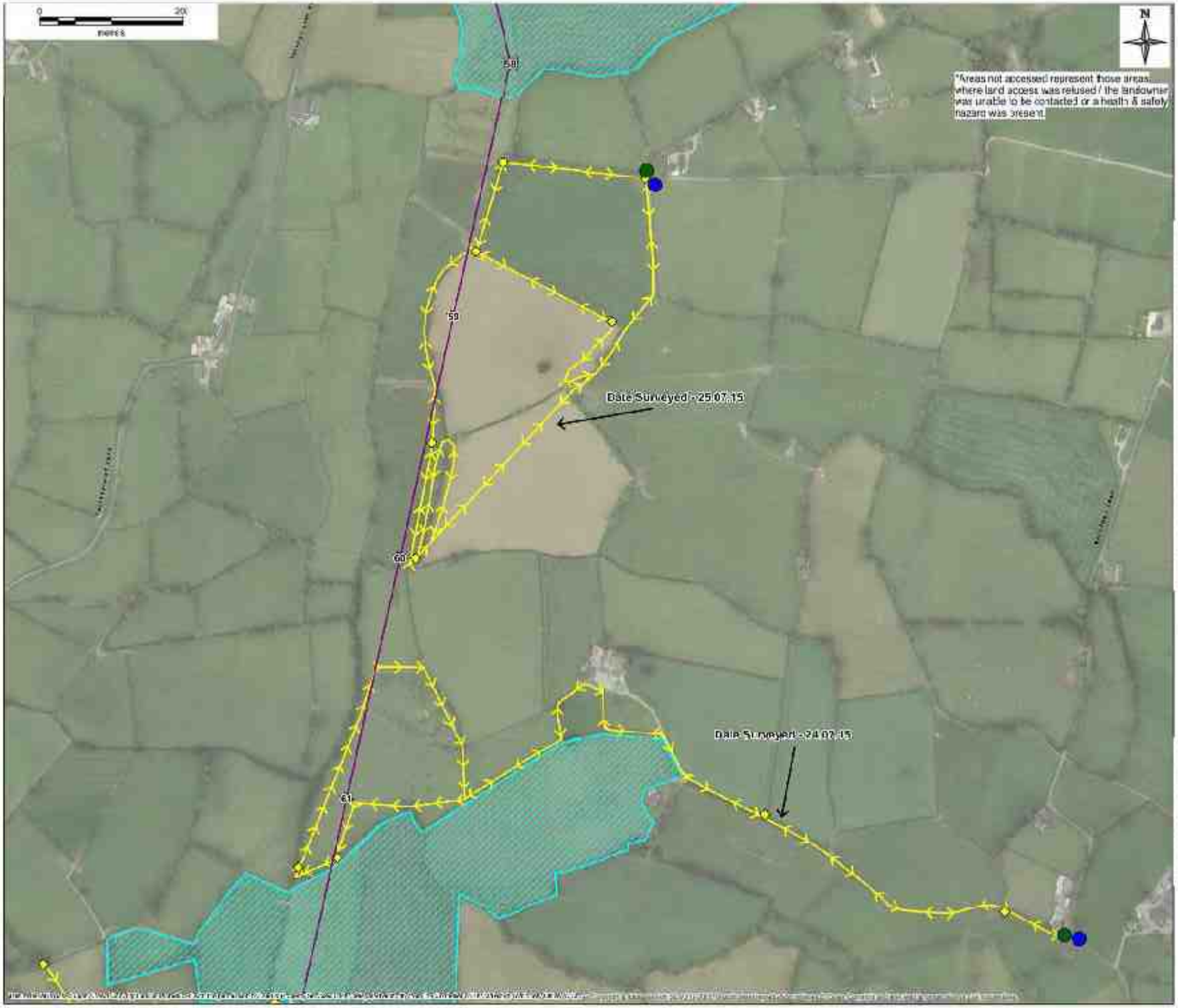
DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1M



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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- Proposed Tower and Maximum Tower Foundation
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0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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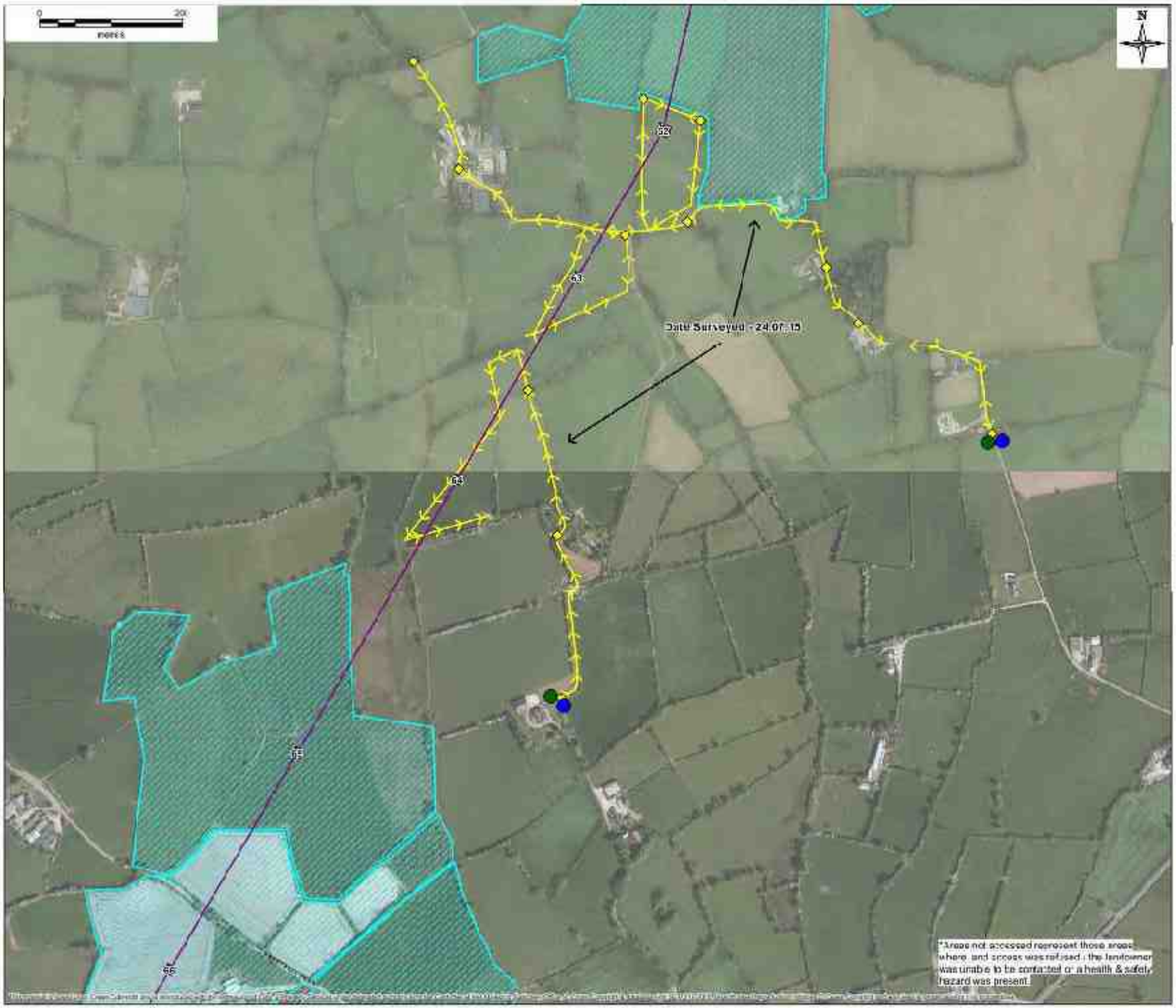

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

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VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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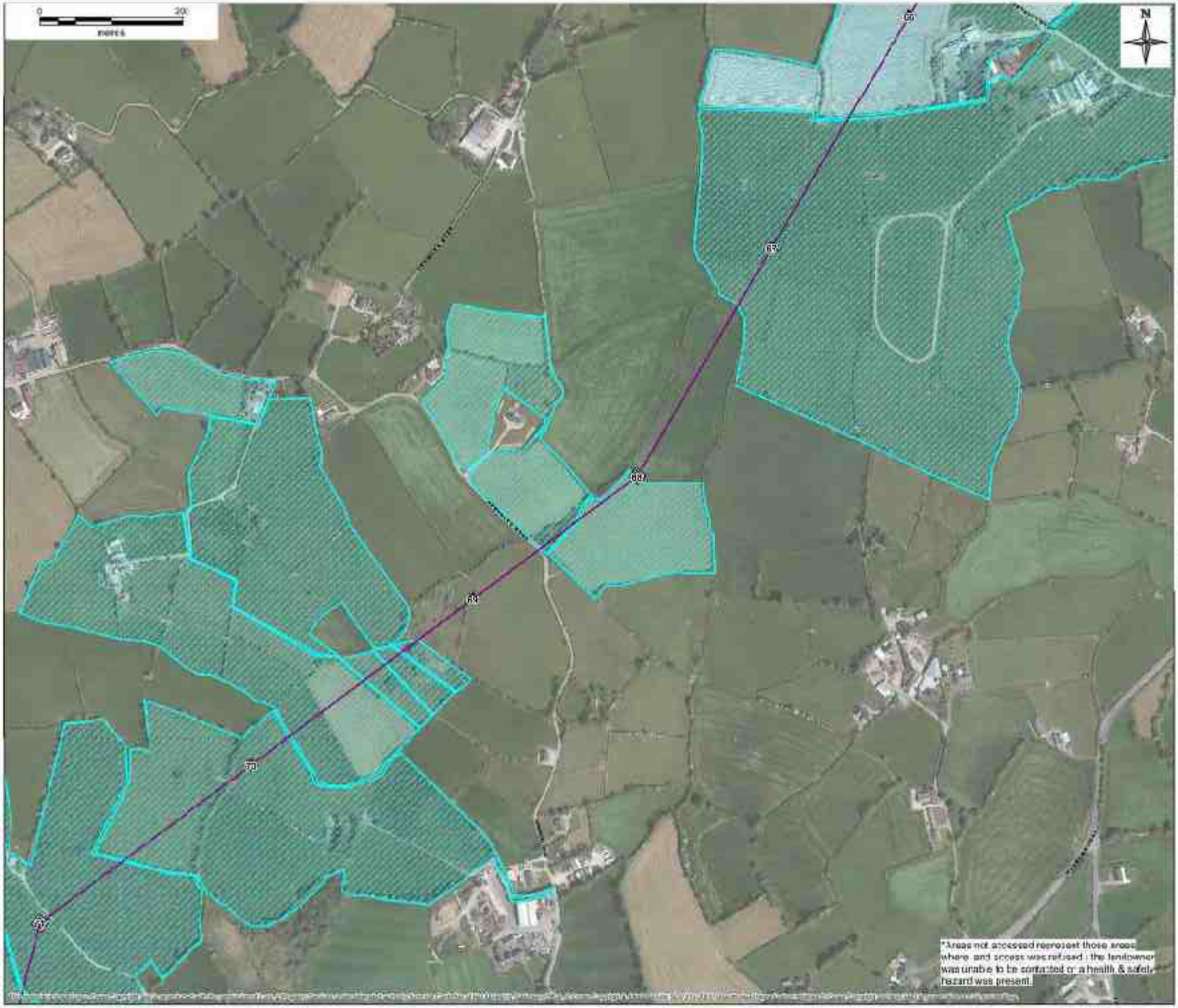

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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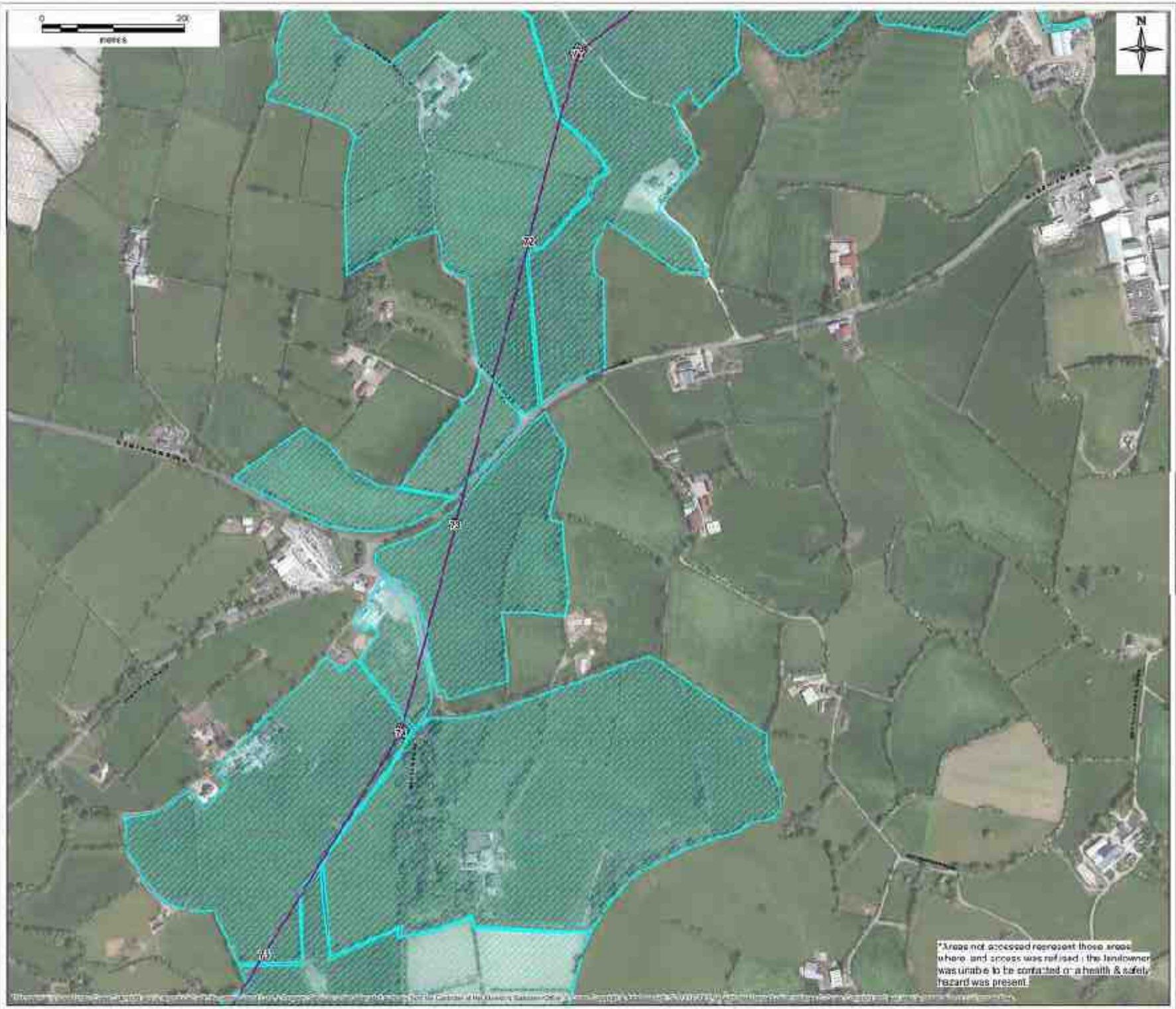

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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
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DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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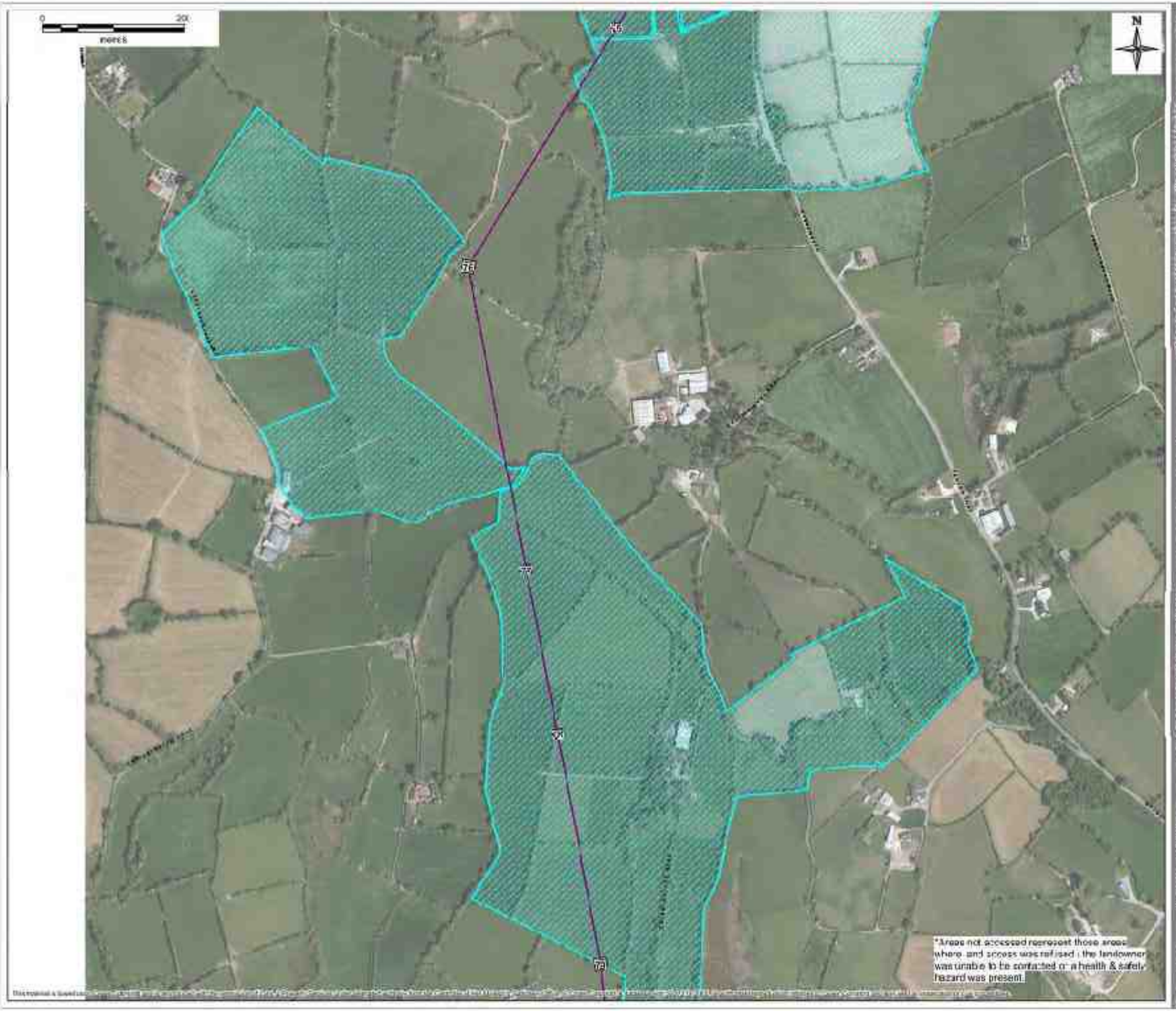
DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/10



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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

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VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draws and Digitised

DRAWN: JM
CHECKED: MM
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DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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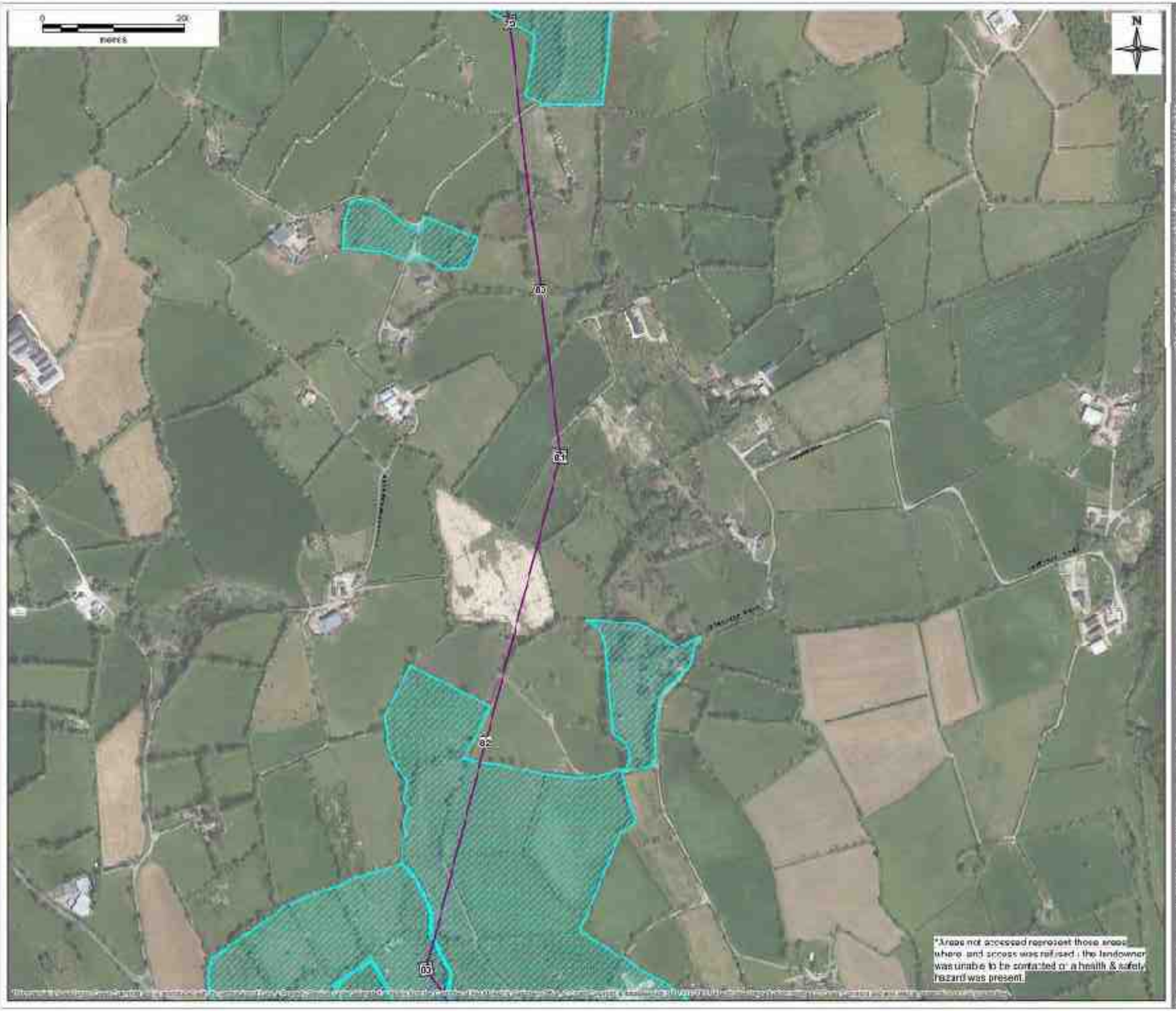
DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1R



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
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DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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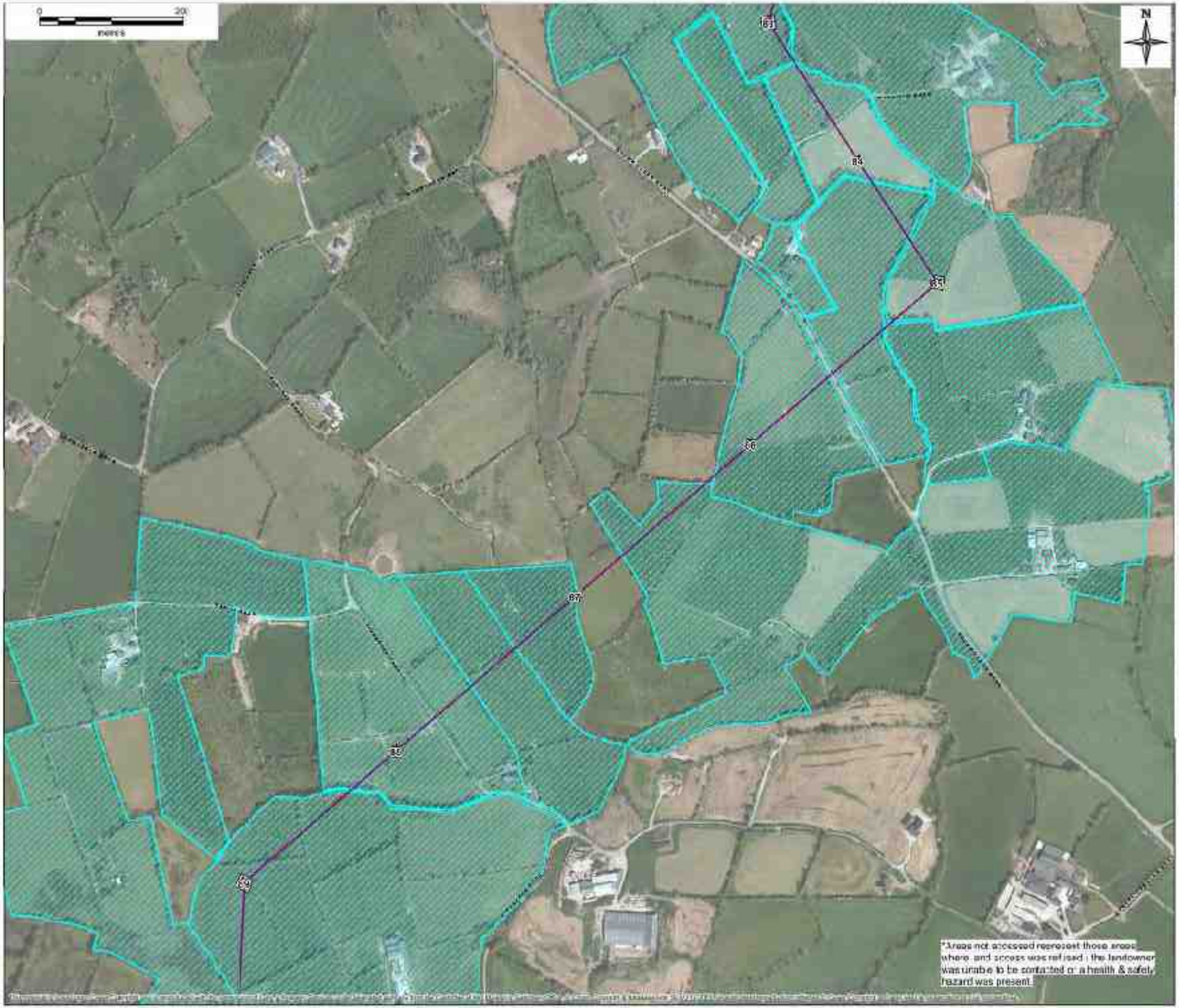
DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1S



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Drawn and Digitised

DRAWN: JM
CHECKED: MM
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DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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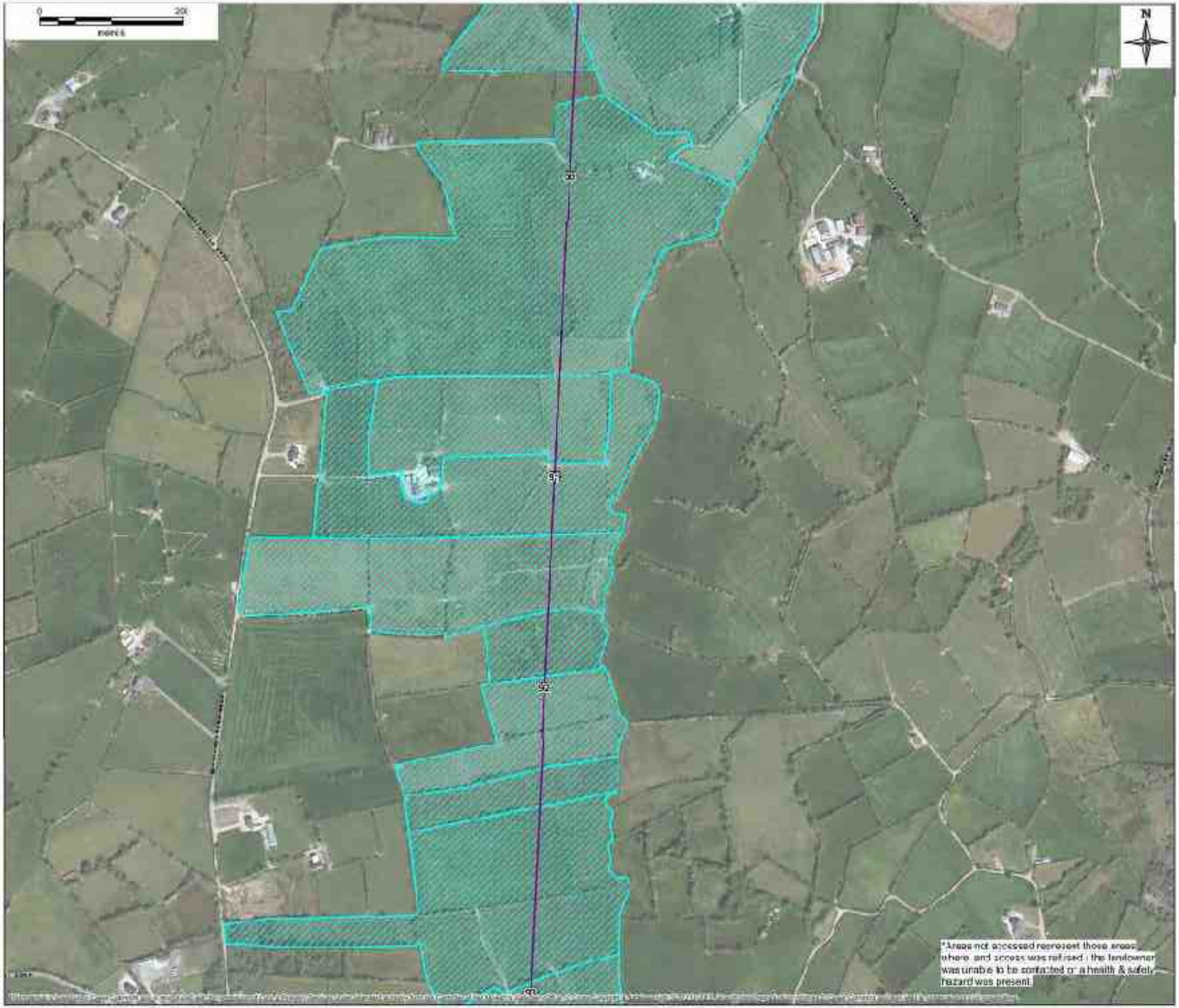

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

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0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
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SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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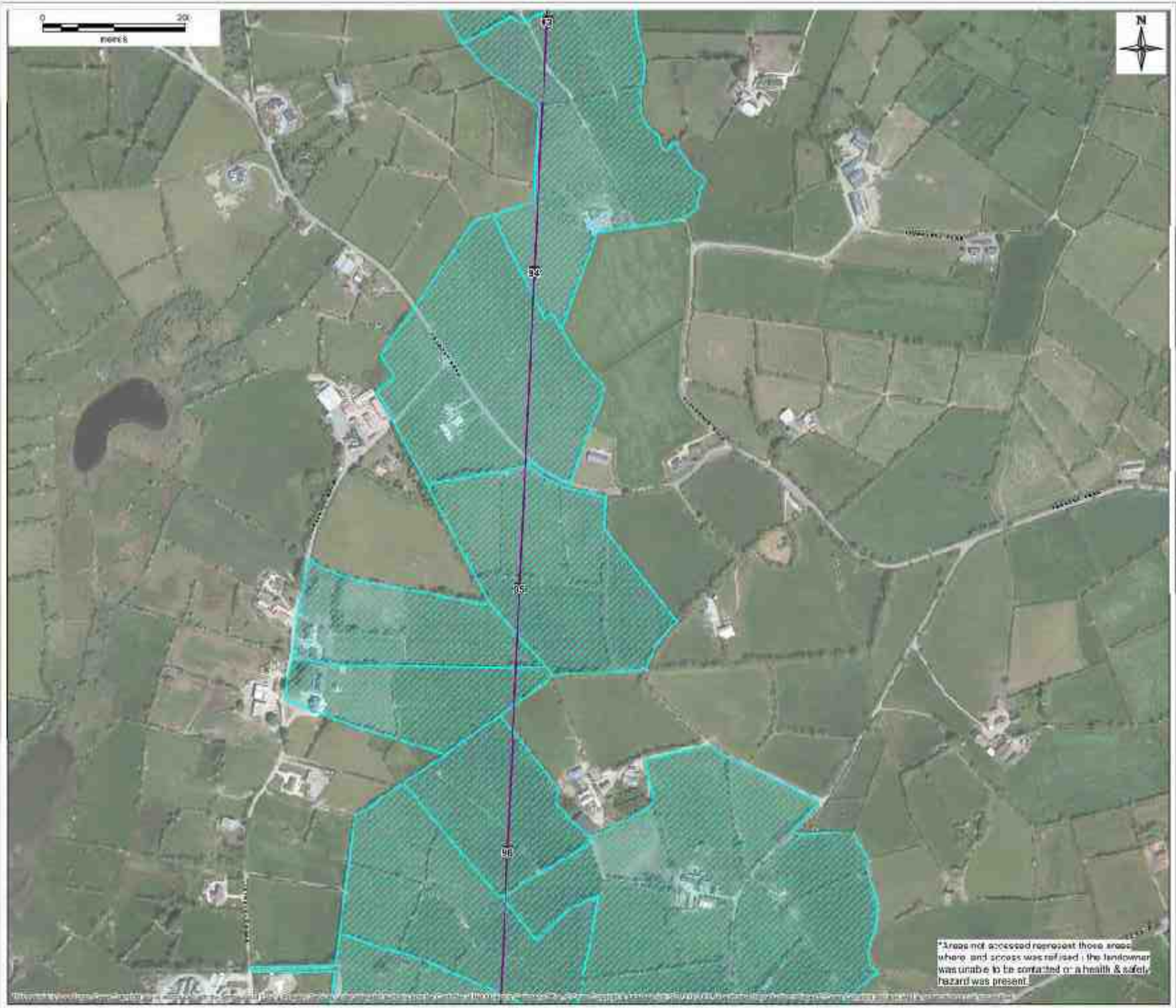

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

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VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
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DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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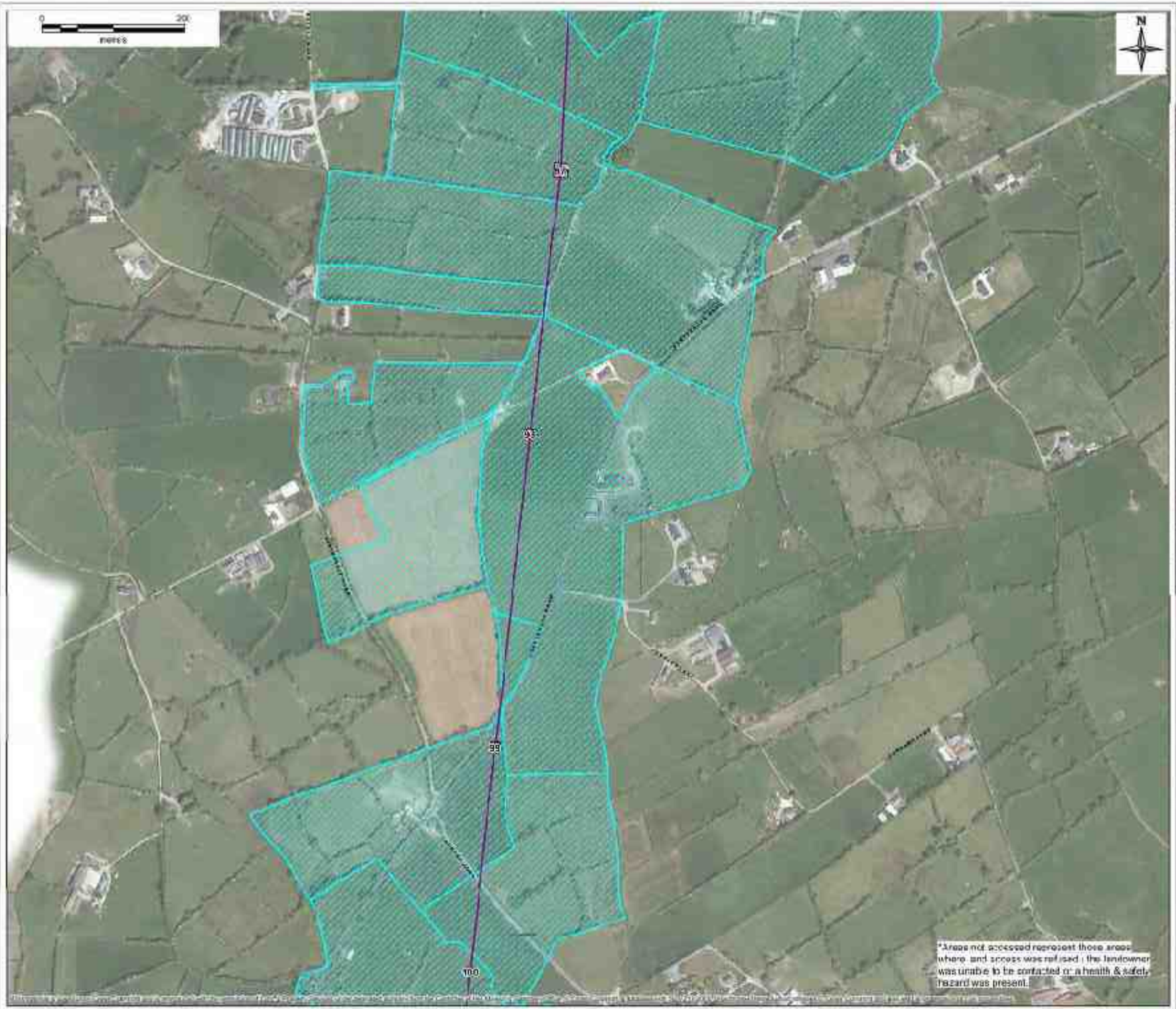

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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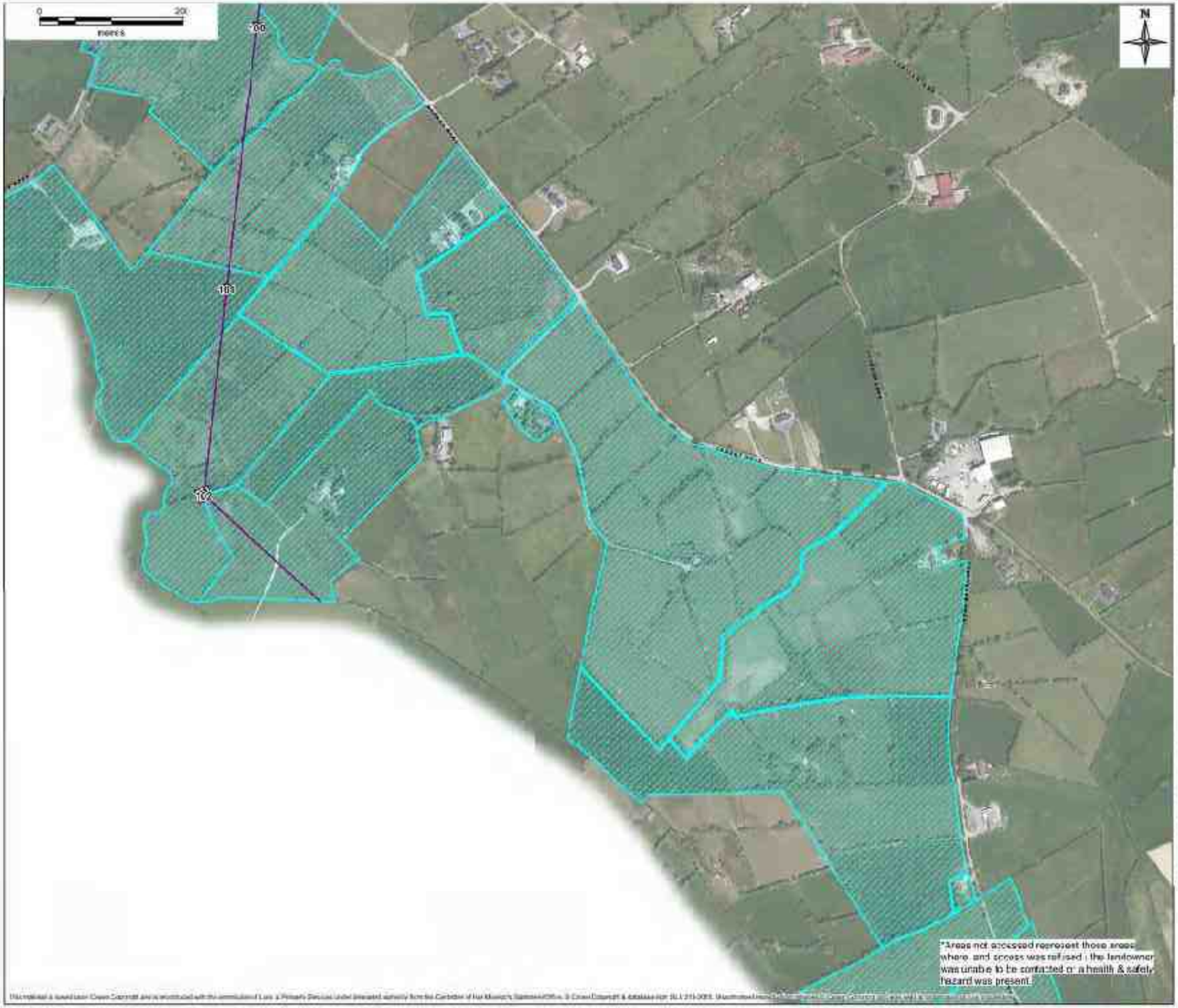

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

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- Proposed 400kV Overhead Line (Centreline)
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REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: ELB/FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

60320996/3528/1X

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

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VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
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DATE: NOV 2015
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PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Methodology Maps - July 2015

DRAWING NUMBER

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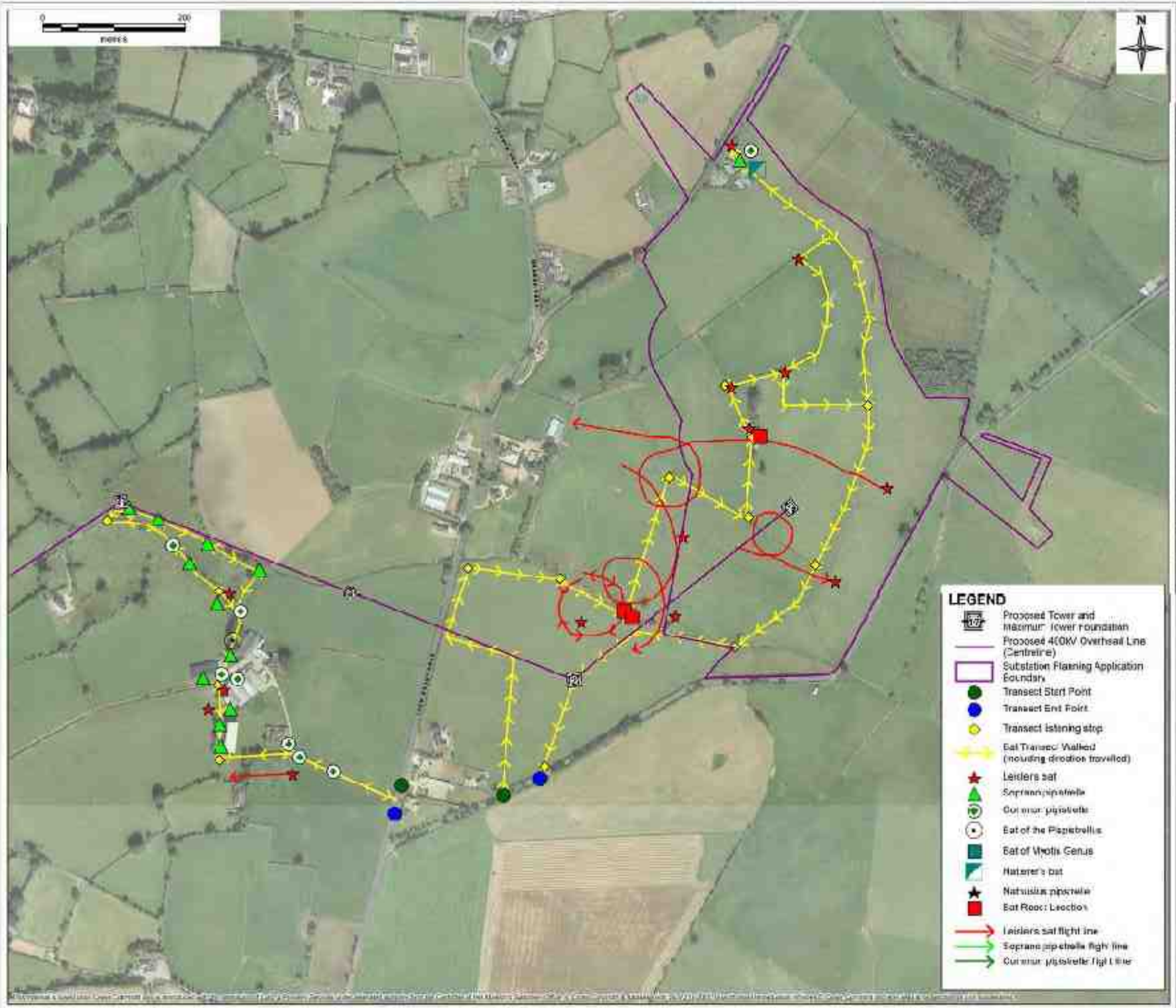

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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

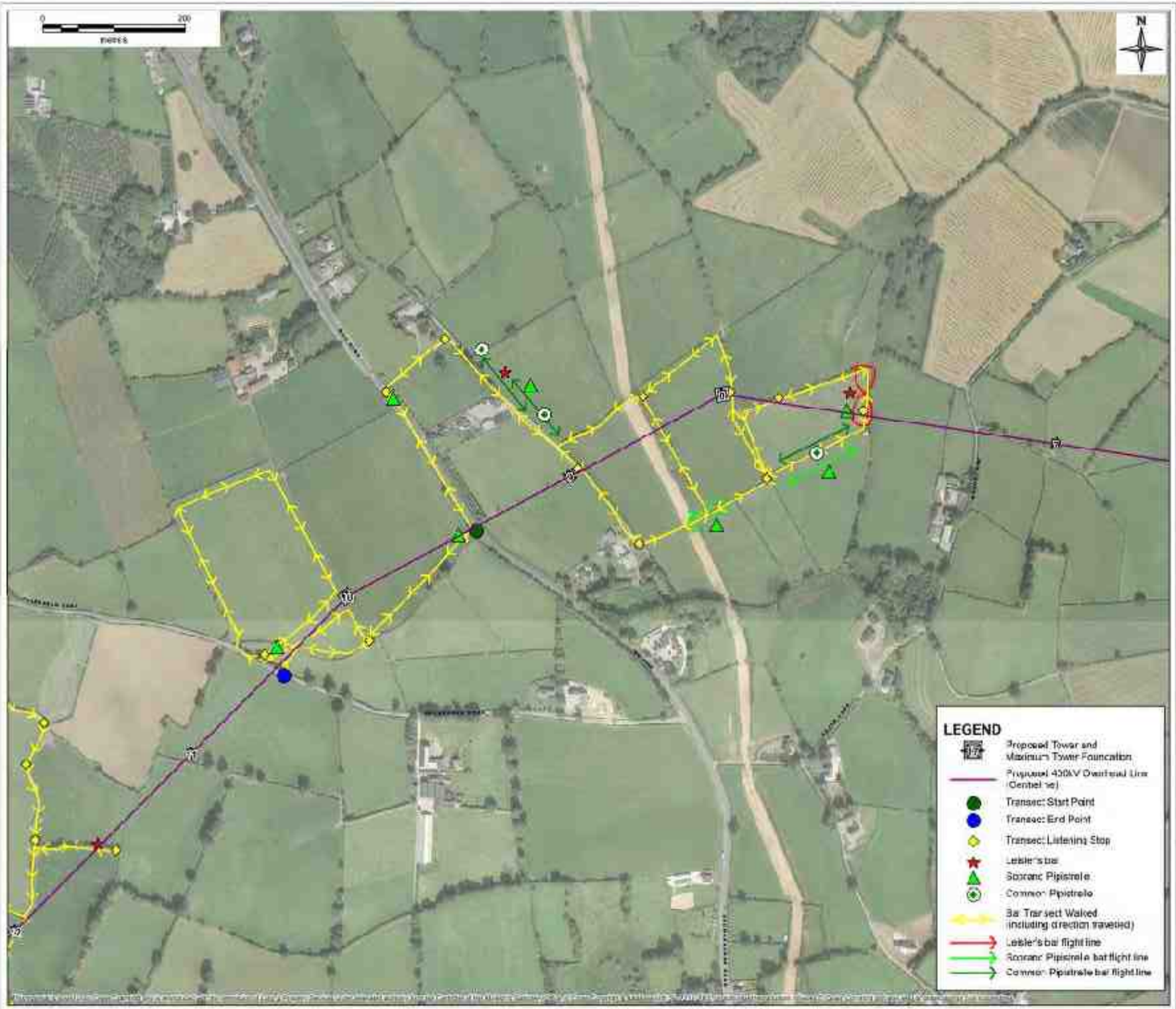
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528.2A



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
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DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

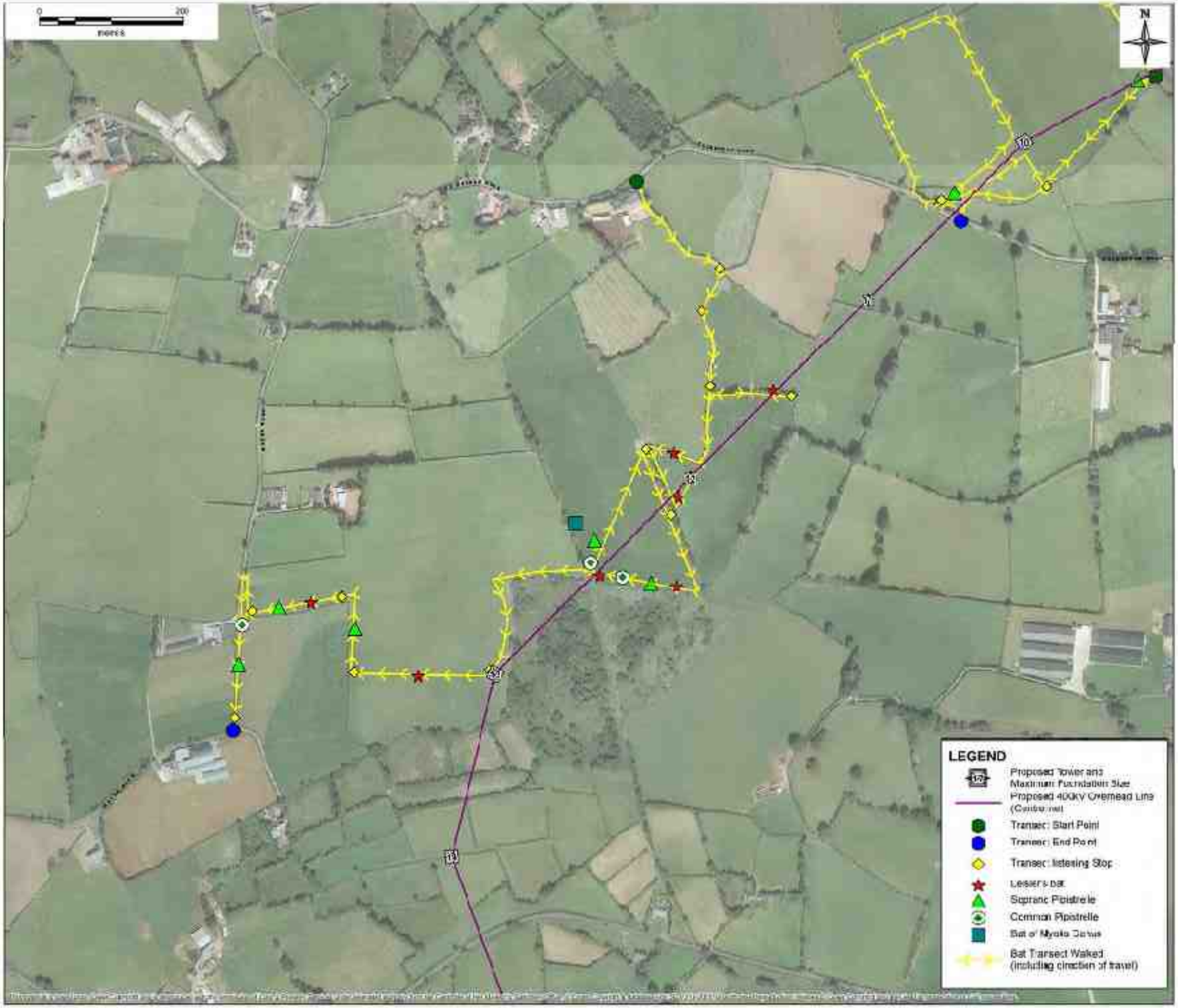
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528/28



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
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DRAWN: JM
CHECKED: MM
APPROVED: FLEB
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PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

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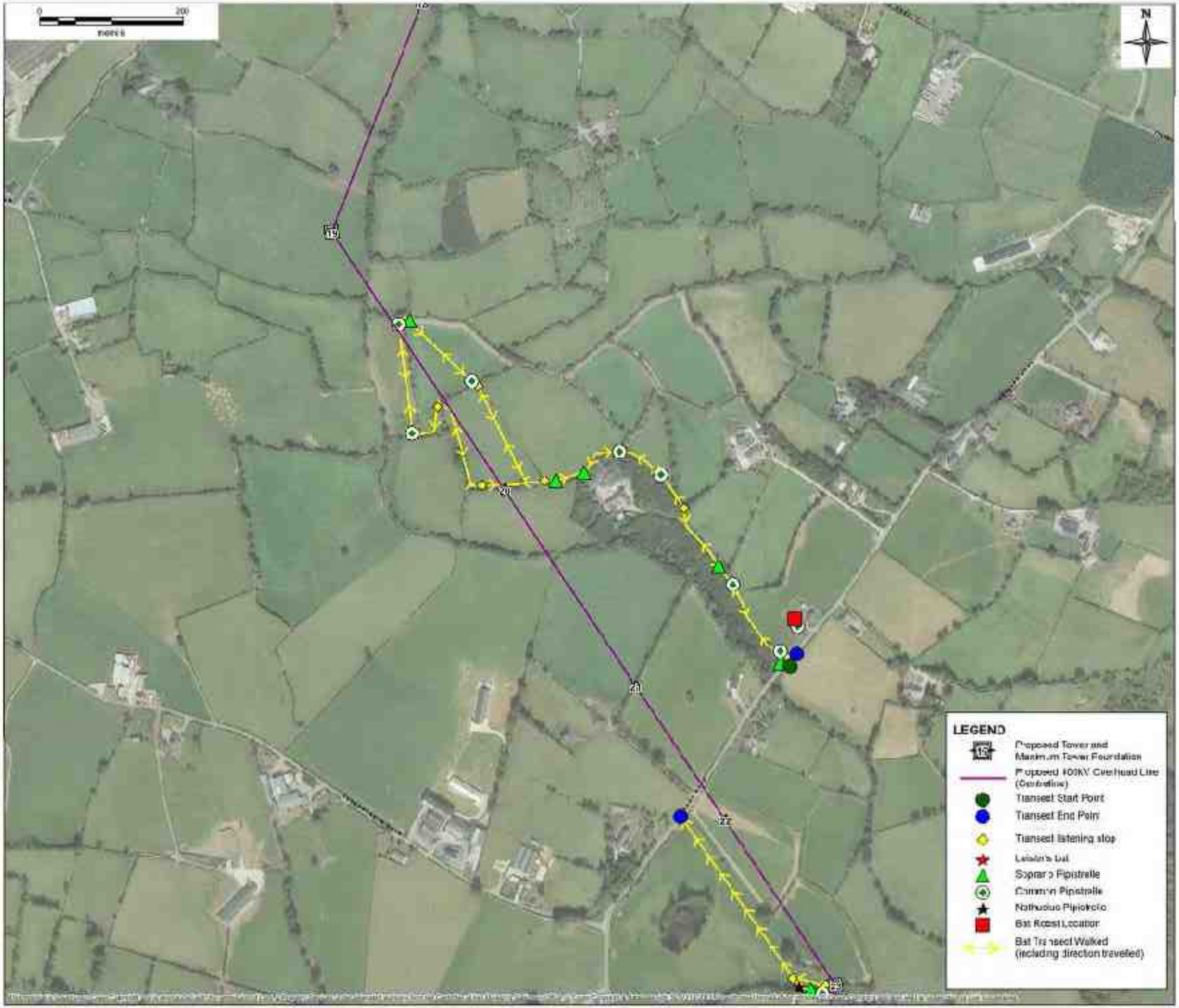

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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

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DRAWING TITLE

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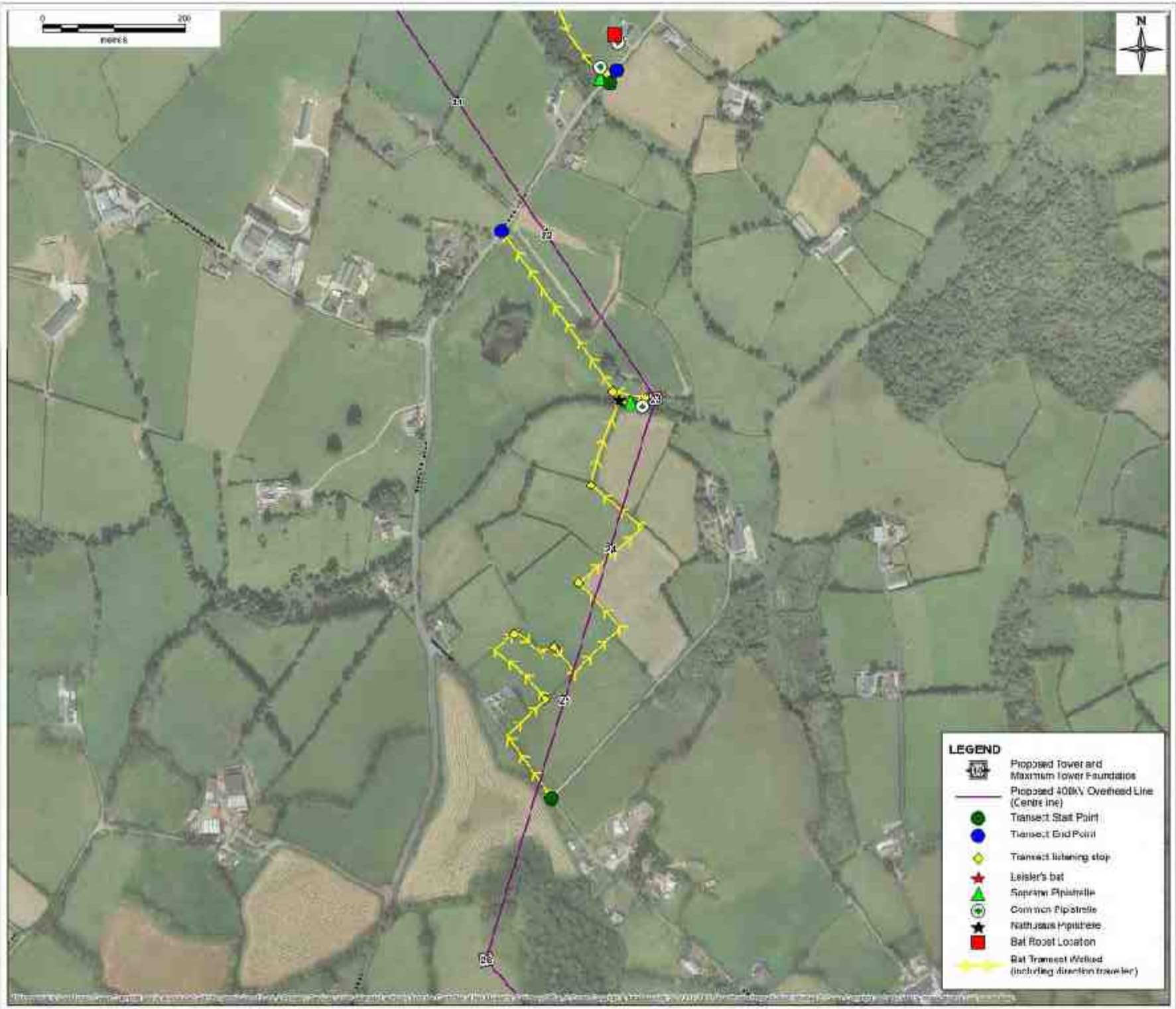
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528/2D



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

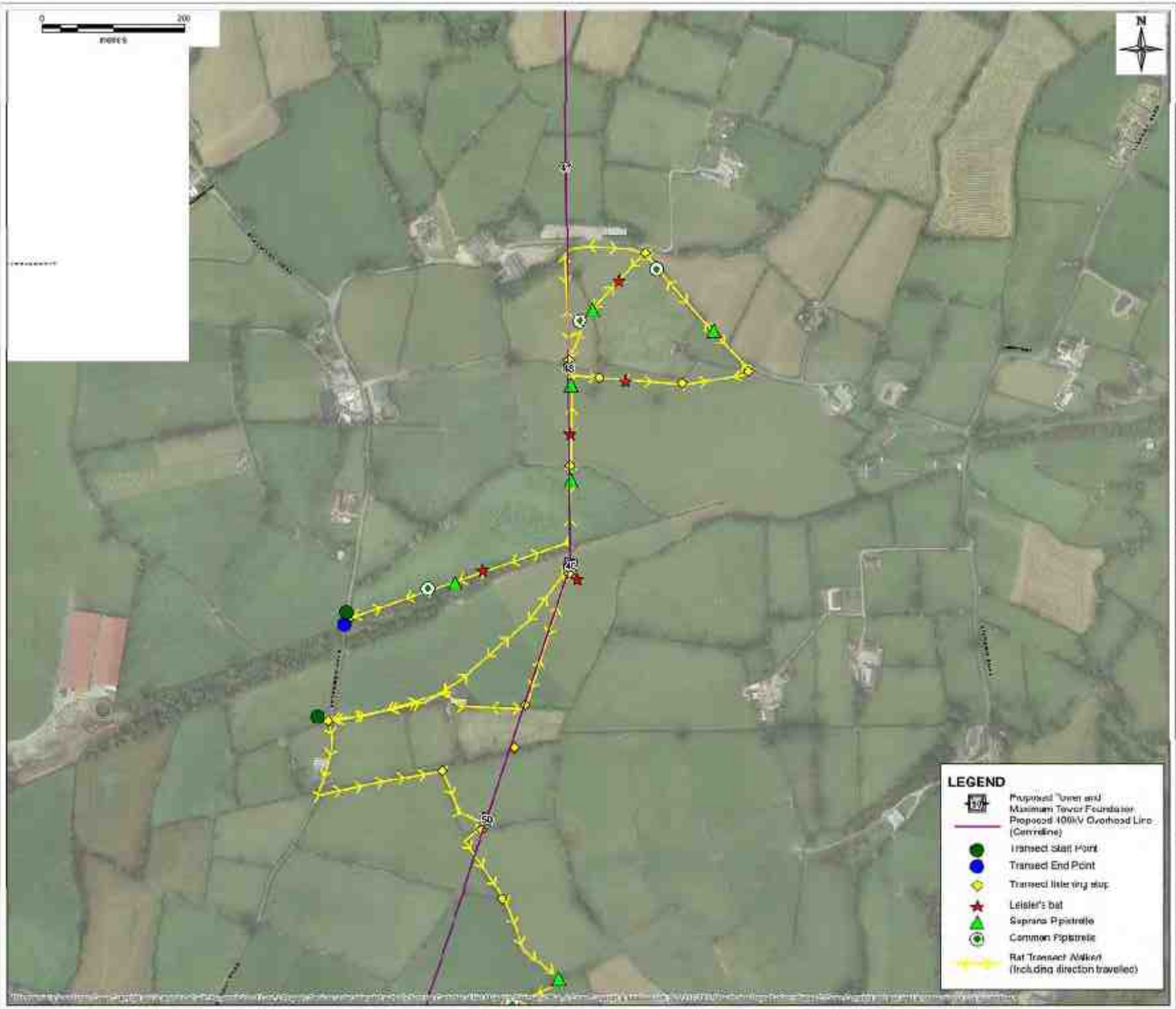
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528.2E



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

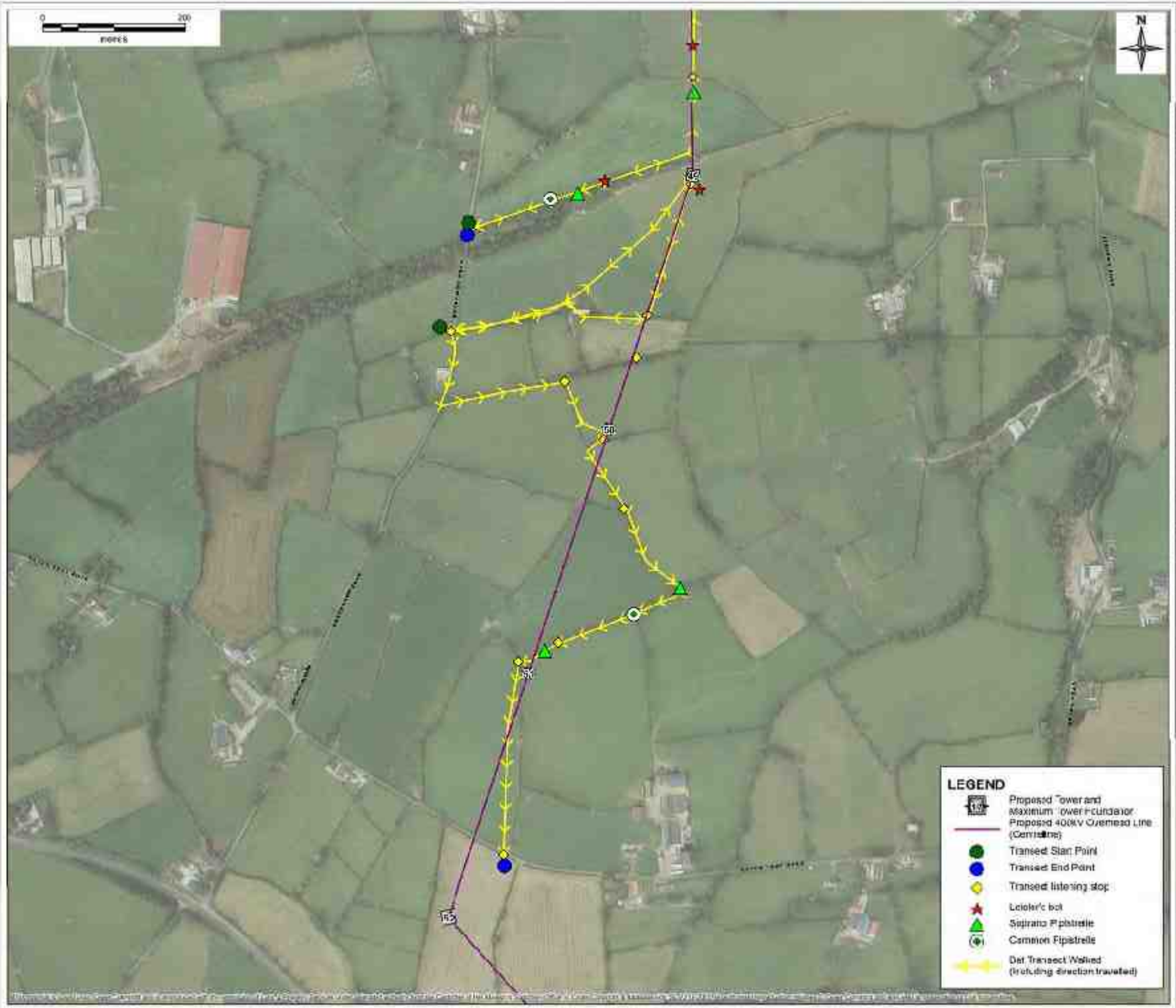
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528.2F



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

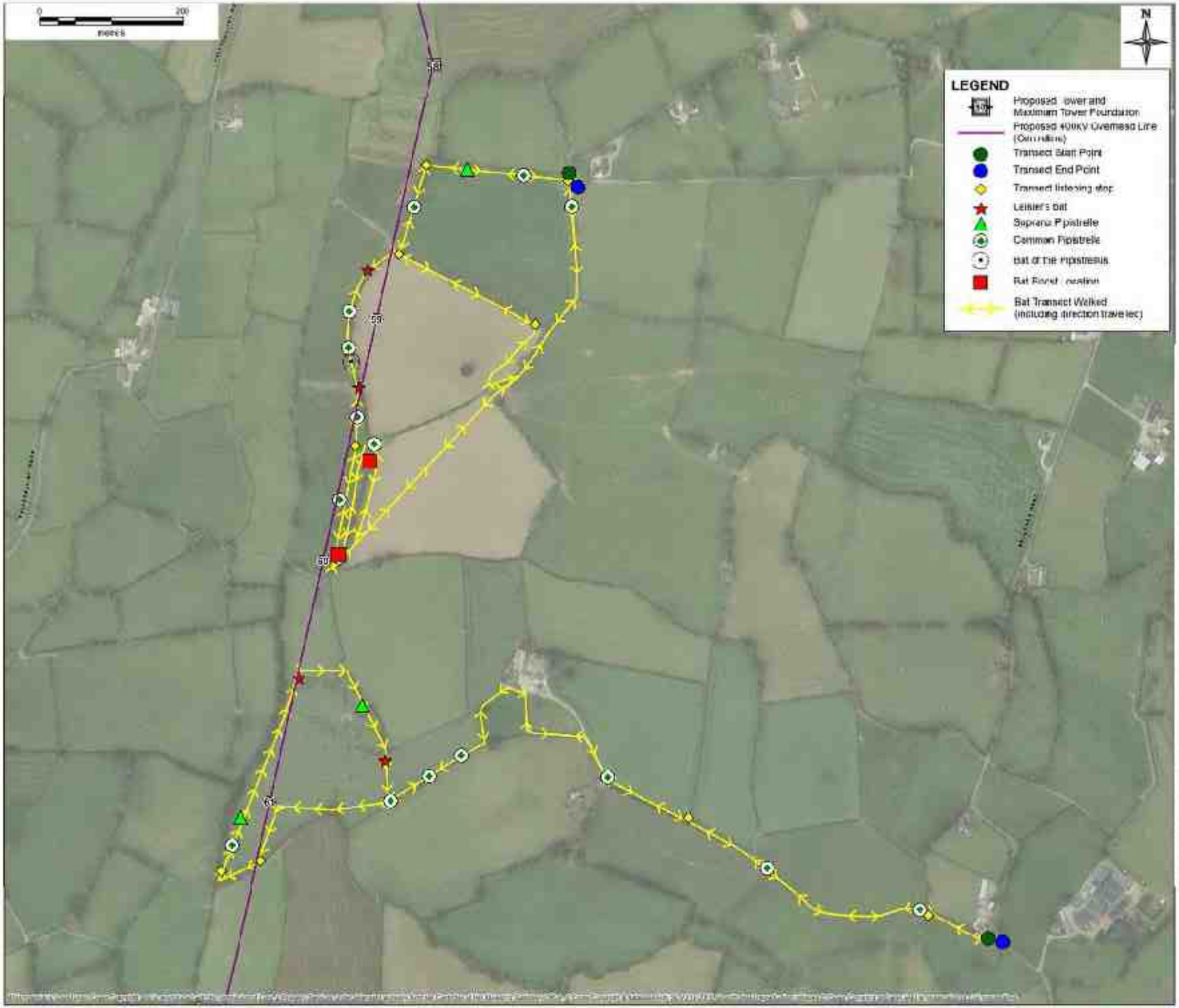
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528/2G



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

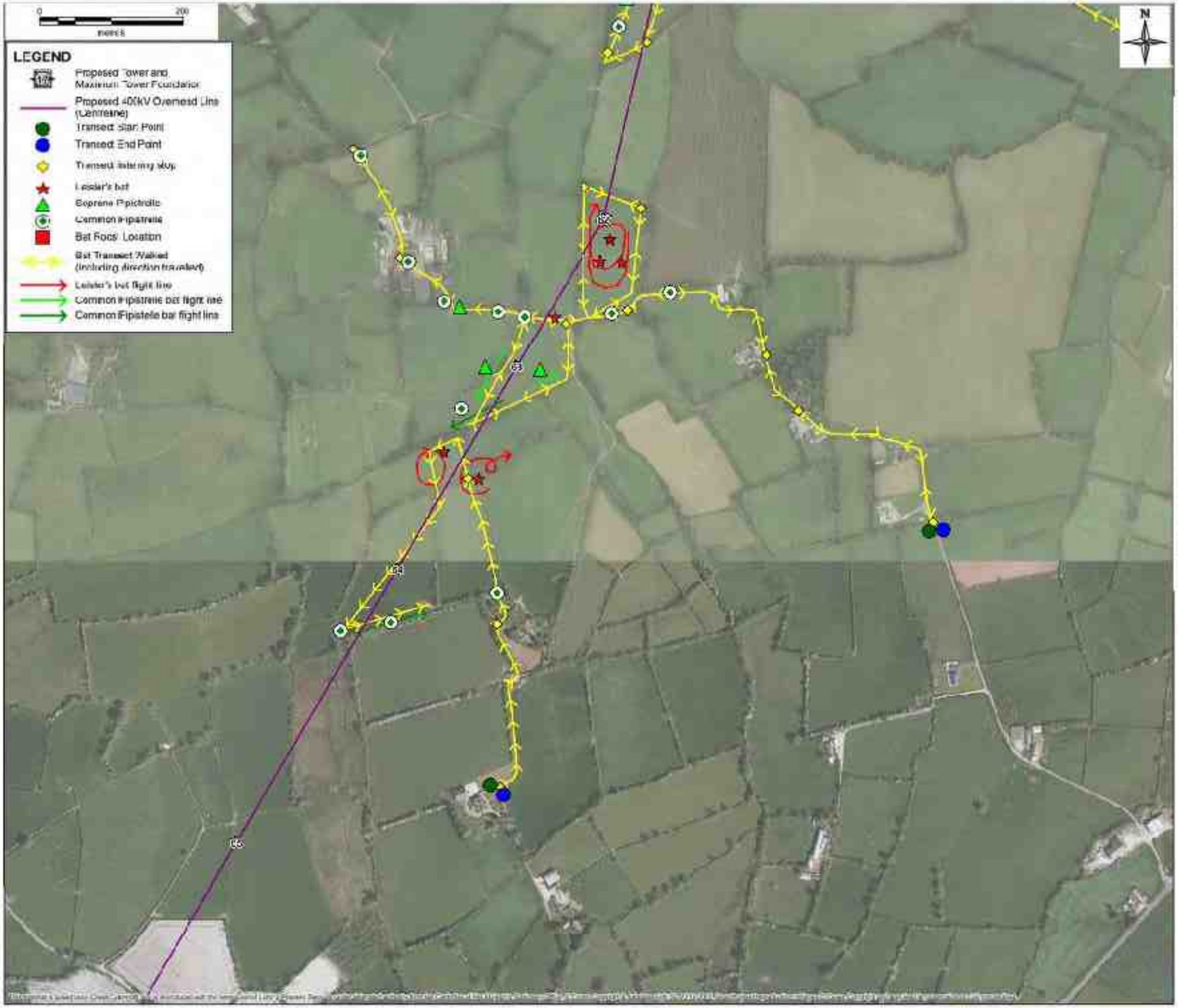
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528.2H



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawings Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

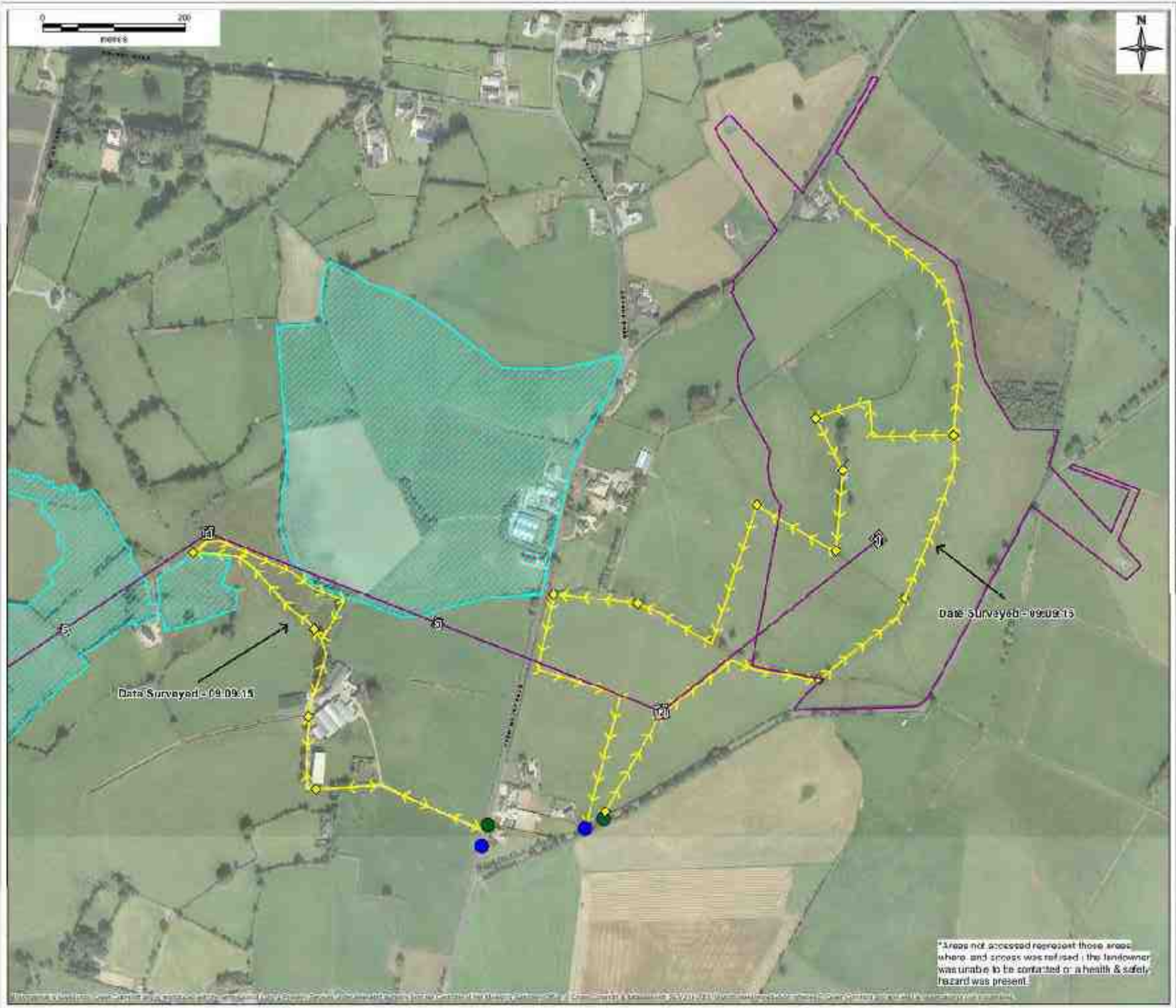
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - July 2015

DRAWING NUMBER

60320996/3528/21



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Foundation
- Proposed 400kV Overhead Line (Centreline)
- Substation Planning Application Boundary
- Transect Start Point
- Transect End Point
- Transect Listening Stop
- Bat Transect Walks
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

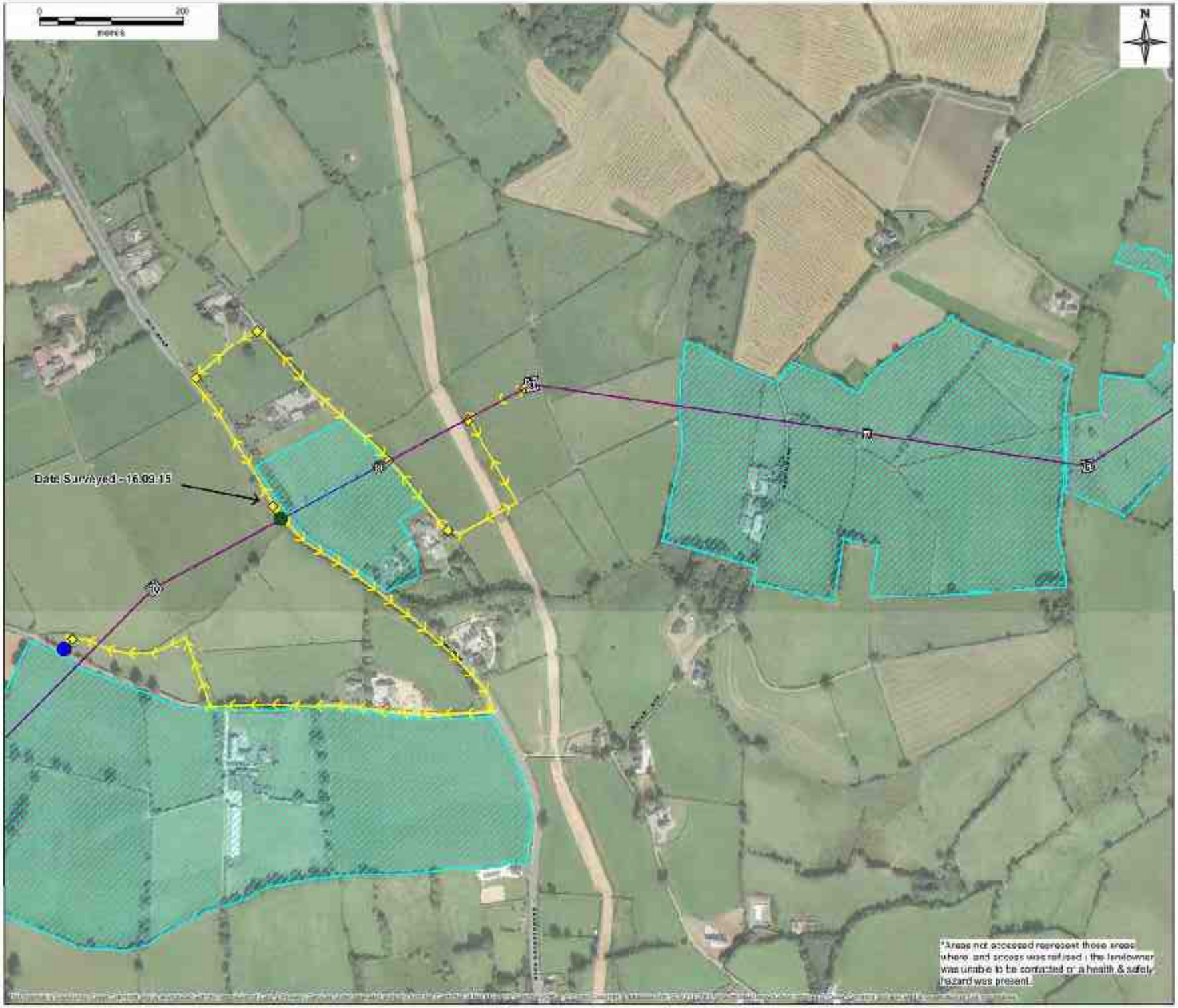
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3A



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

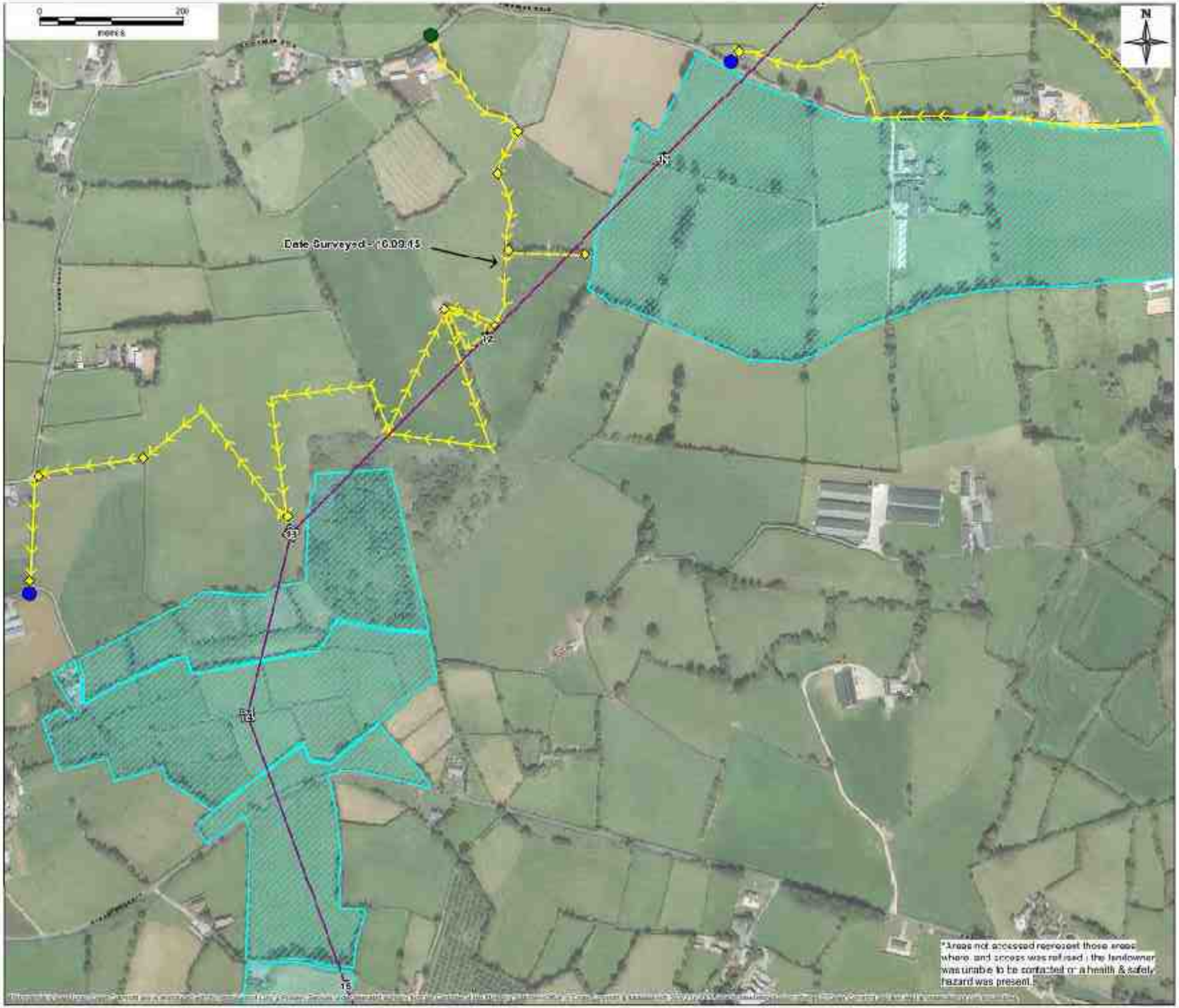
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/38



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

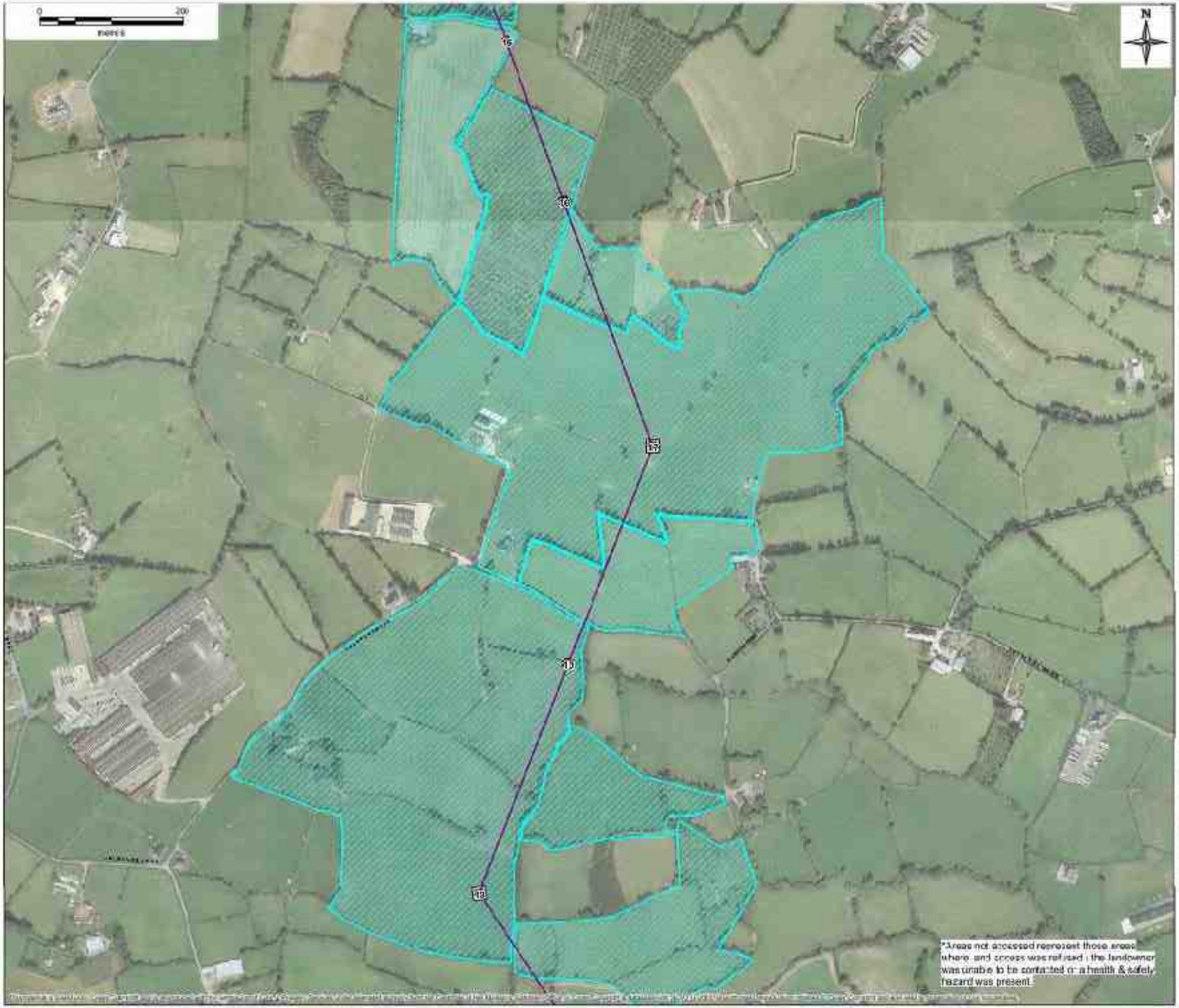
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3C



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Draft

DRAWN:	JM
CHECKED:	MM
APPROVED:	FLEB
DATE:	NOV 2015
SCALE:	1:5000 @ A3

PROJECT NUMBER

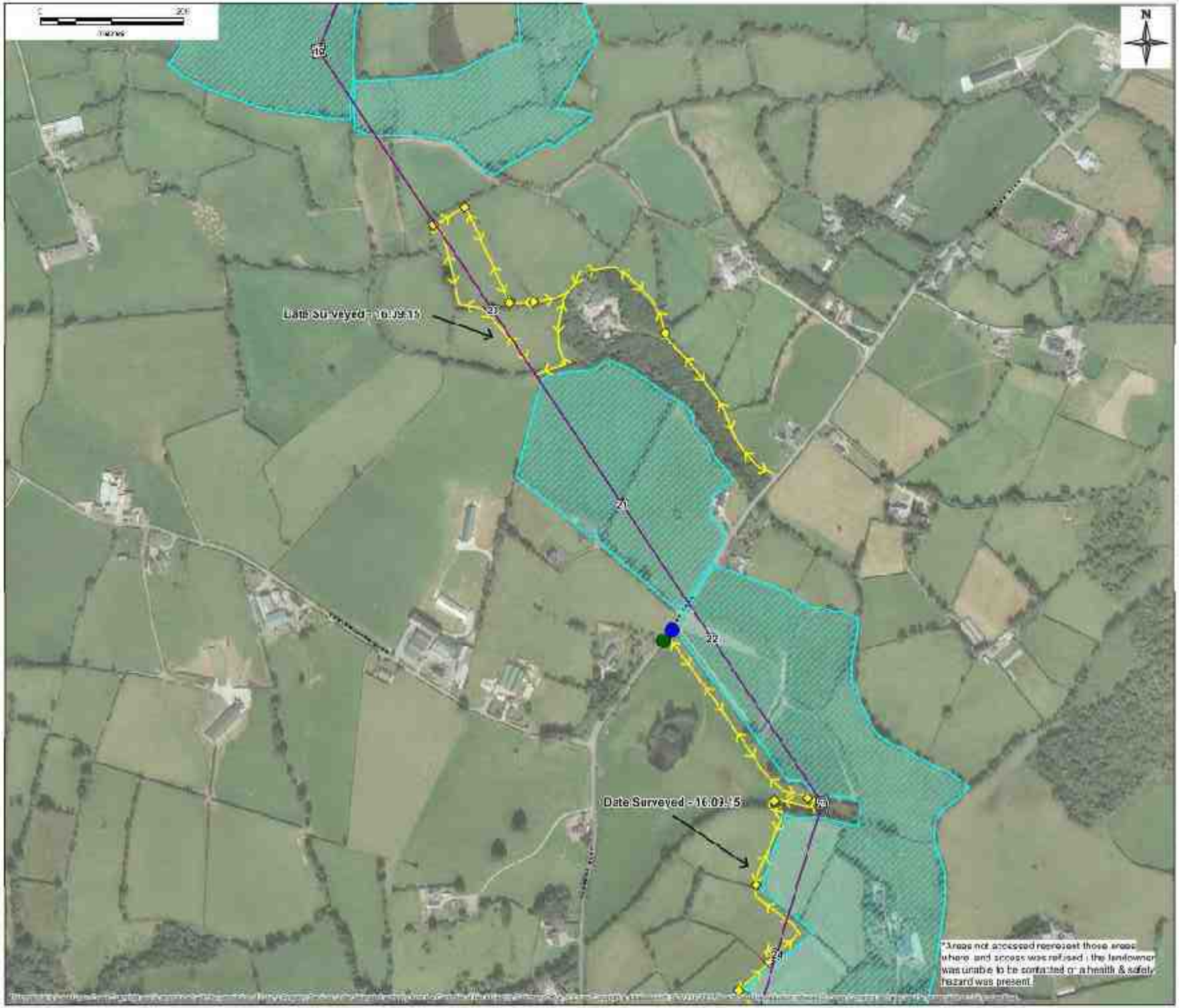
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3D



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

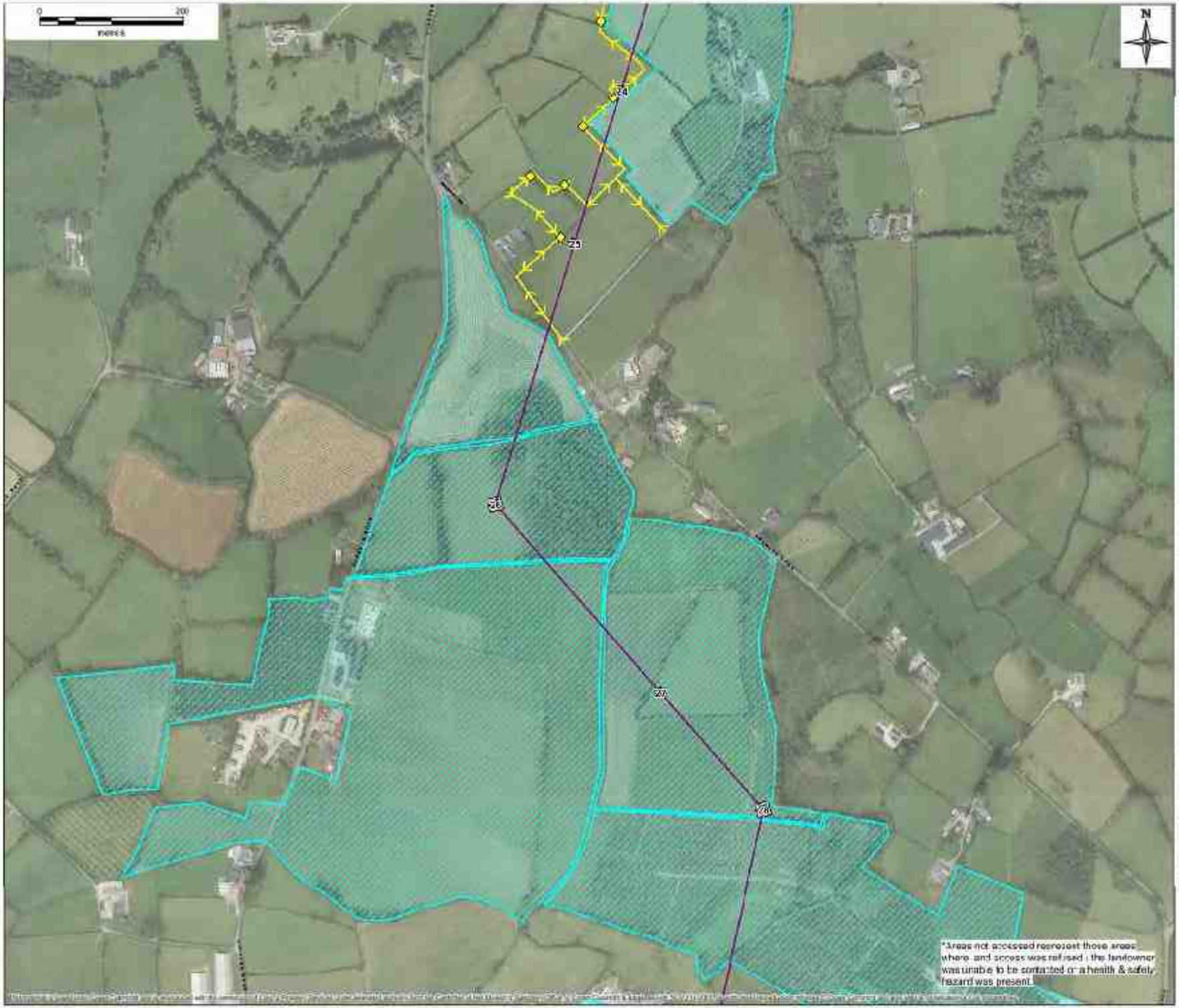
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3E



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

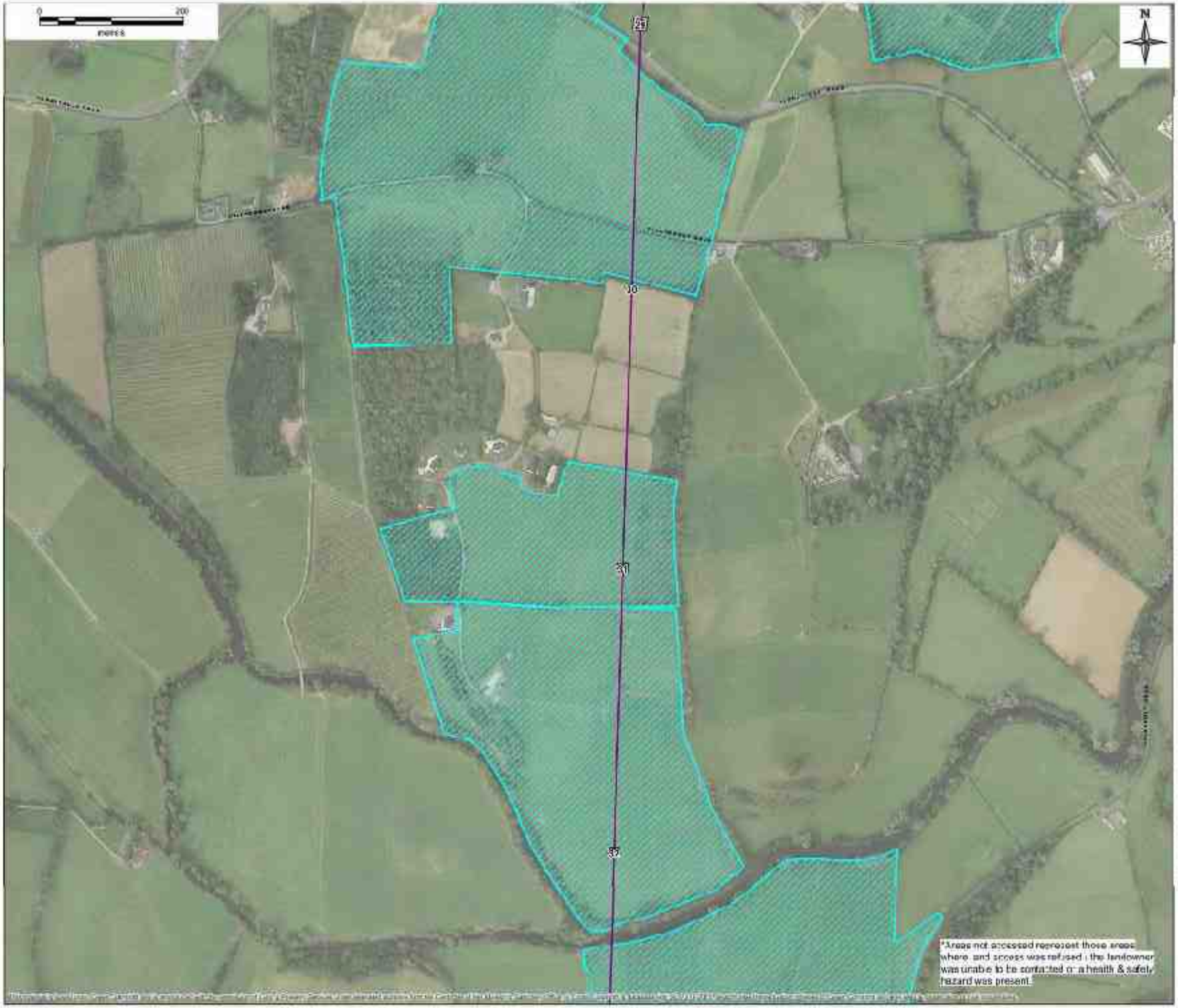
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3F



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Steps
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

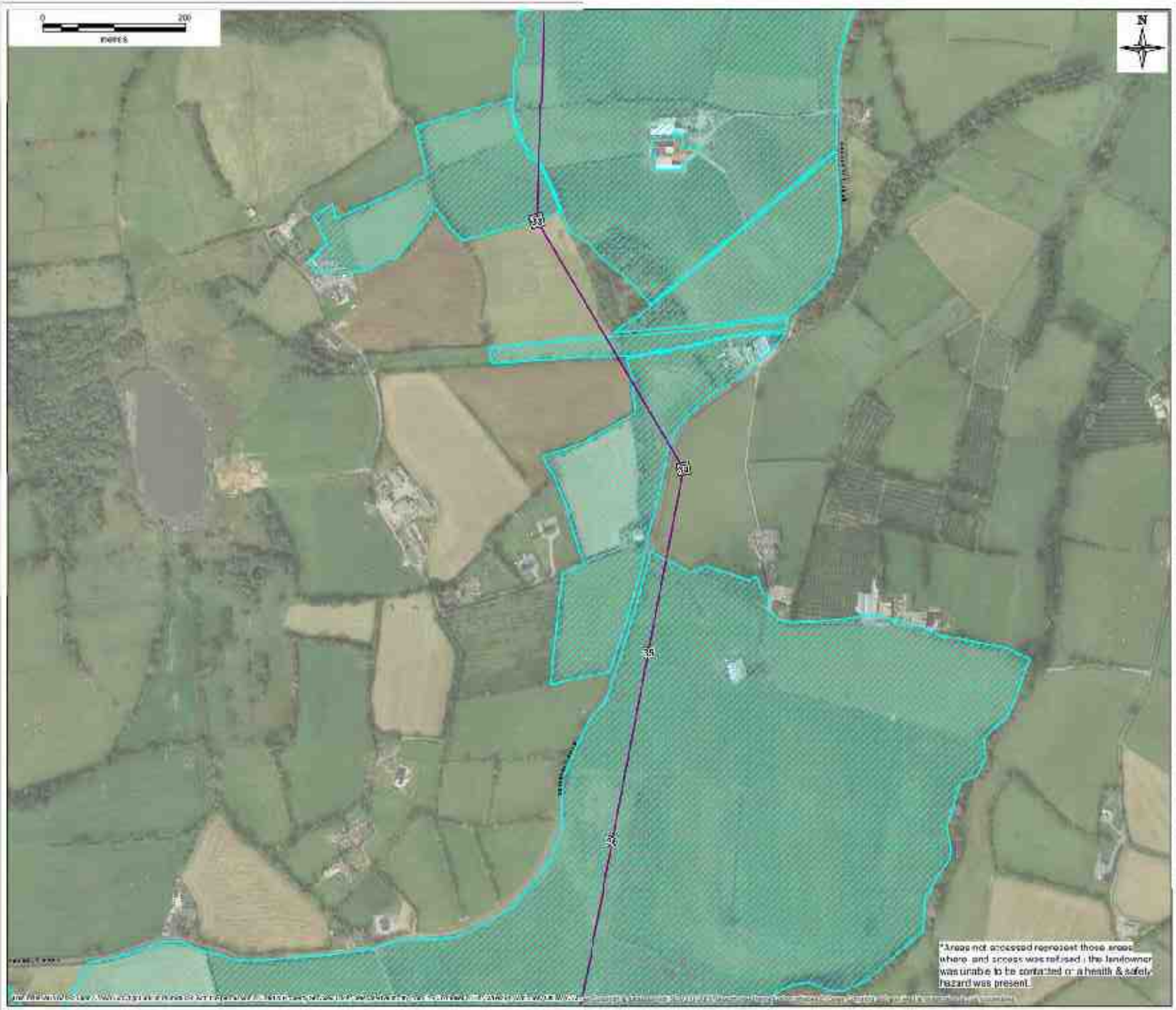
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3G



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

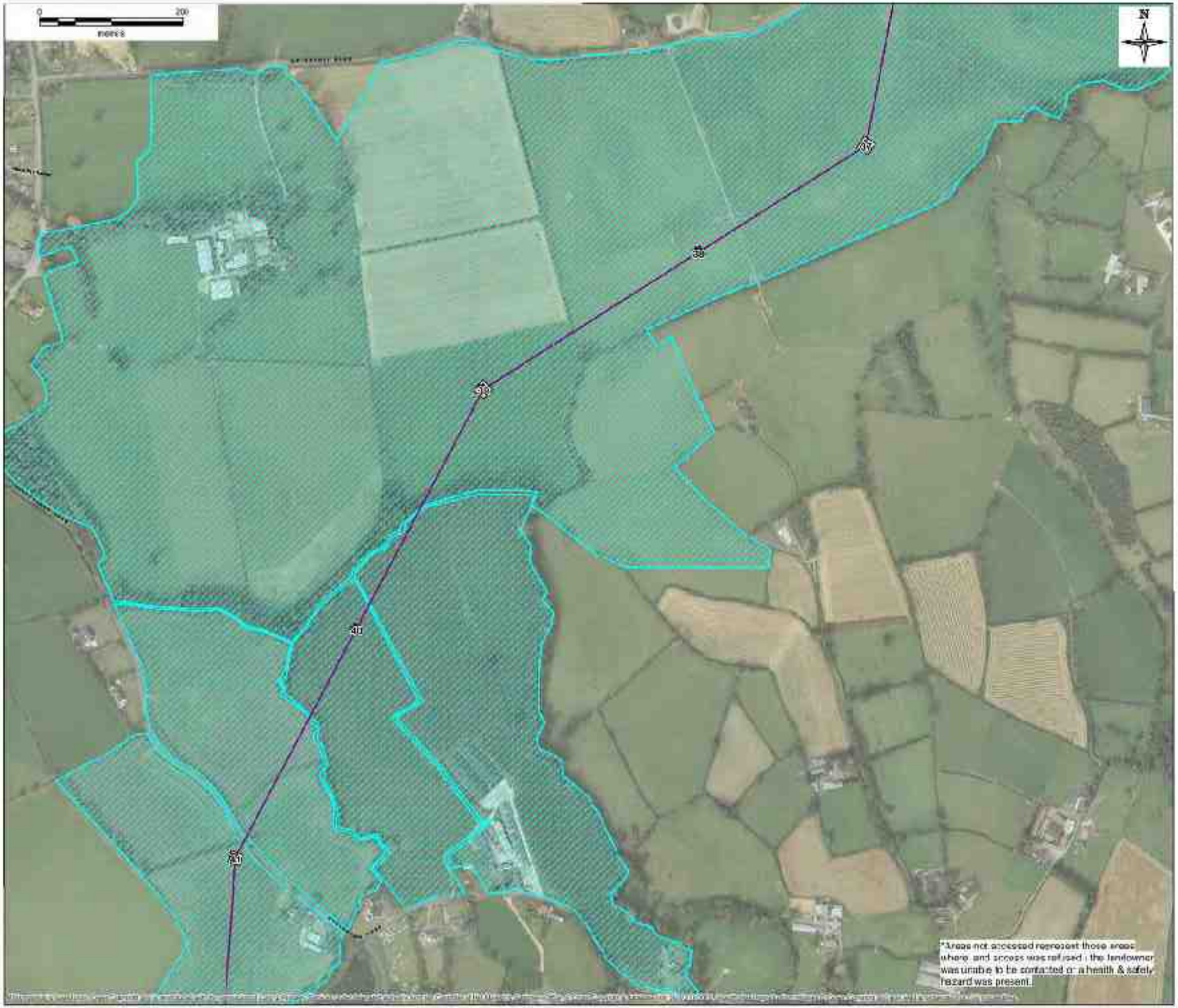
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3H



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

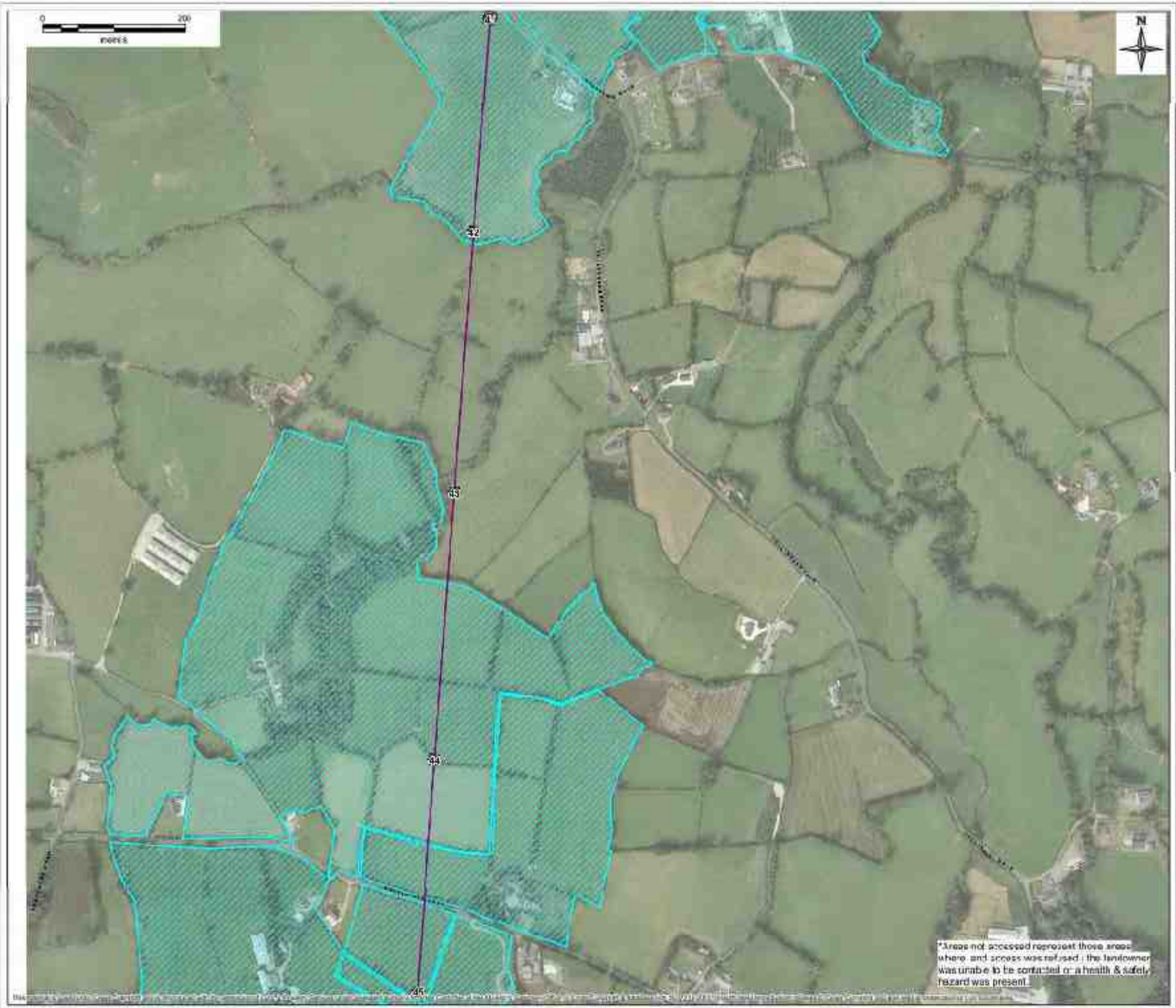
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/31



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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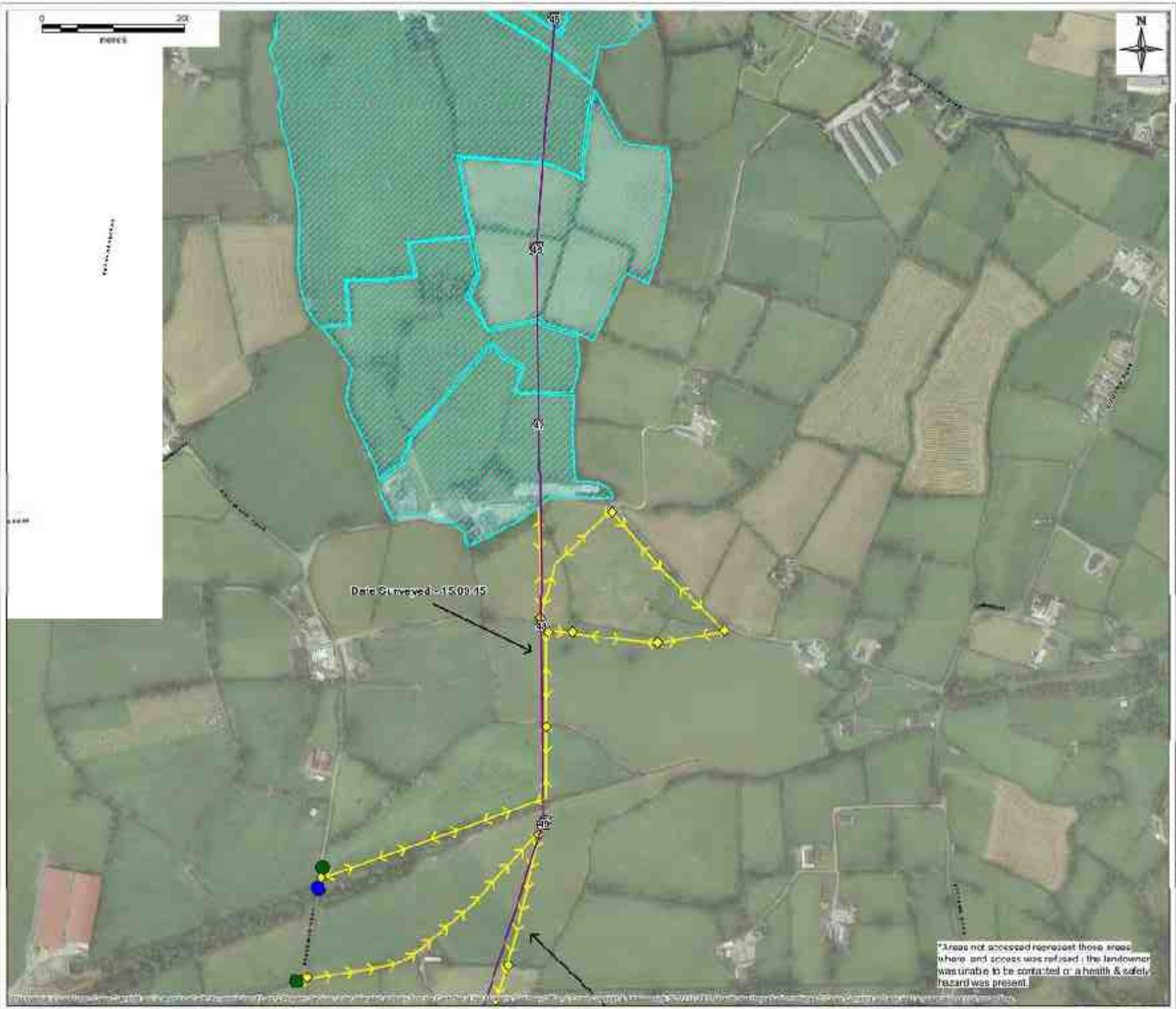
DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/352813_



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including deviation of transect)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

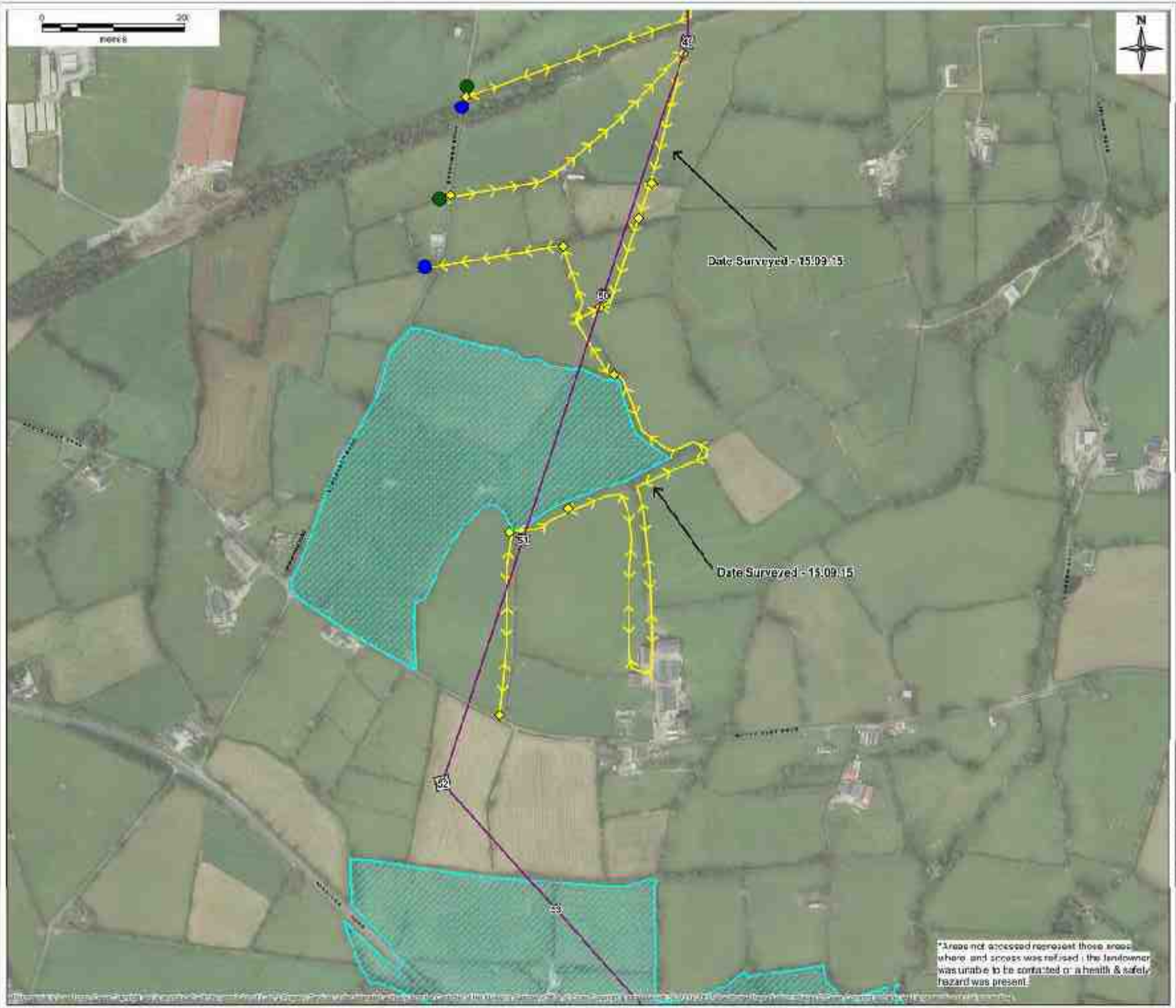
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3K



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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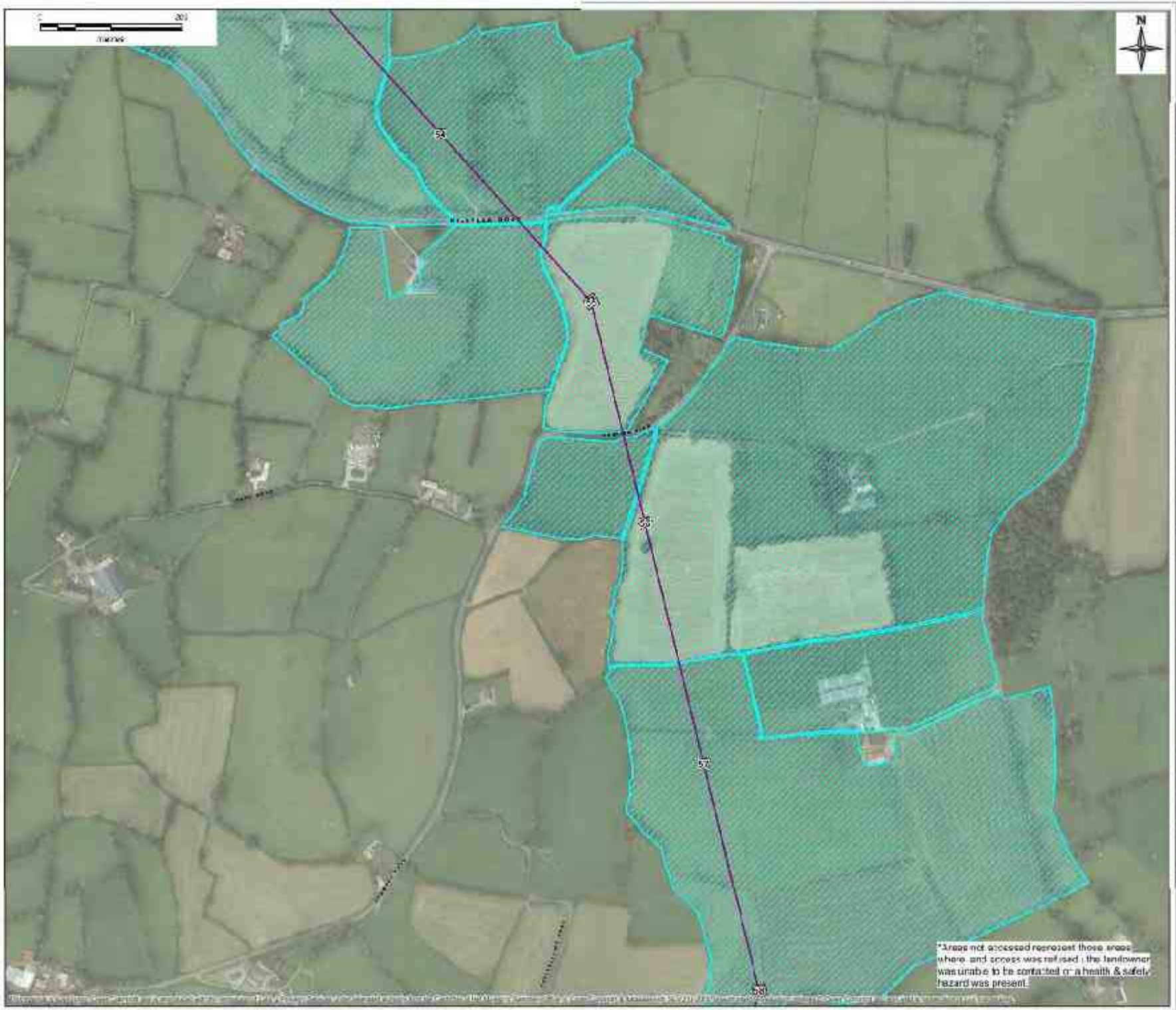
DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3L



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

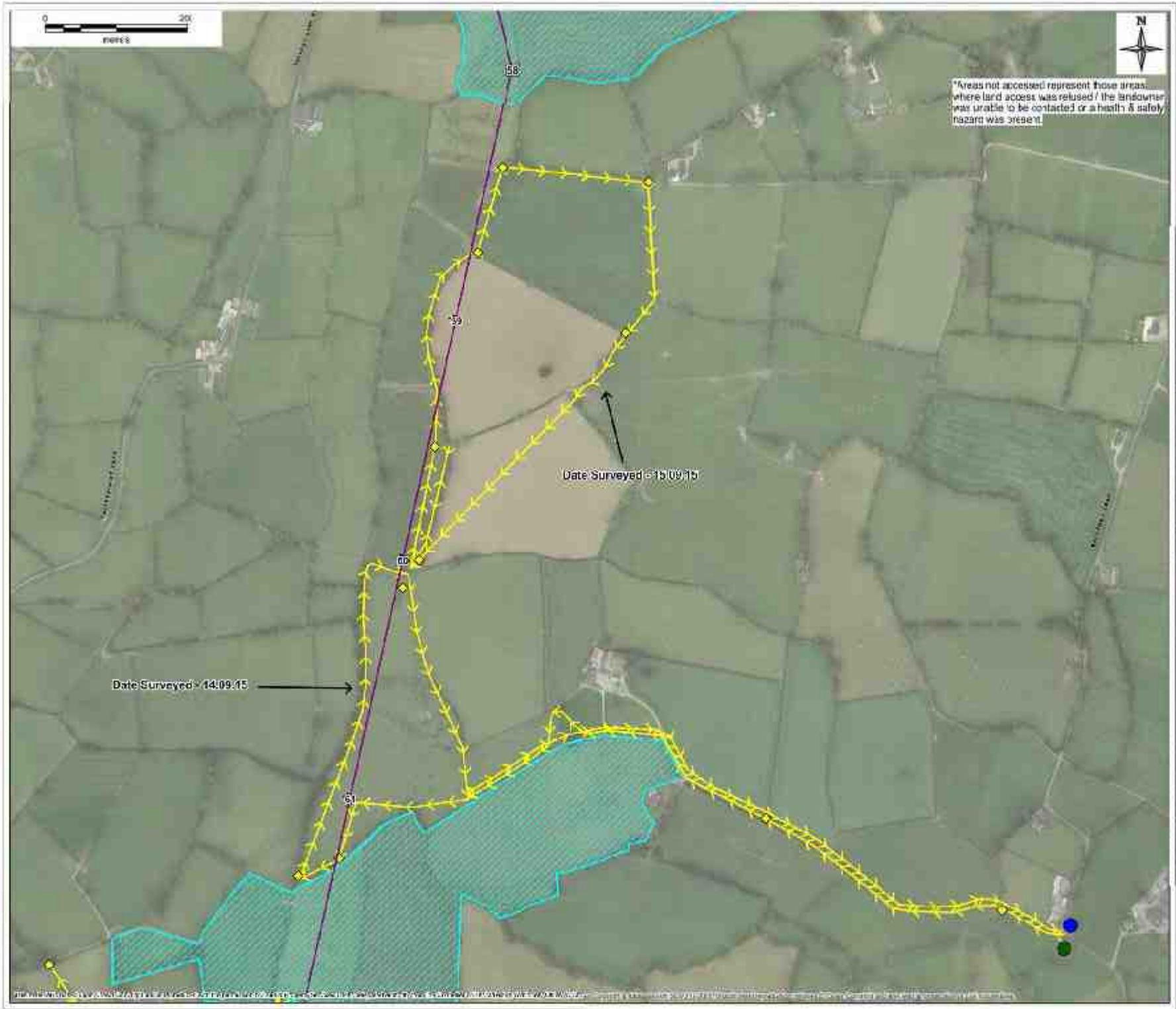
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3M



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

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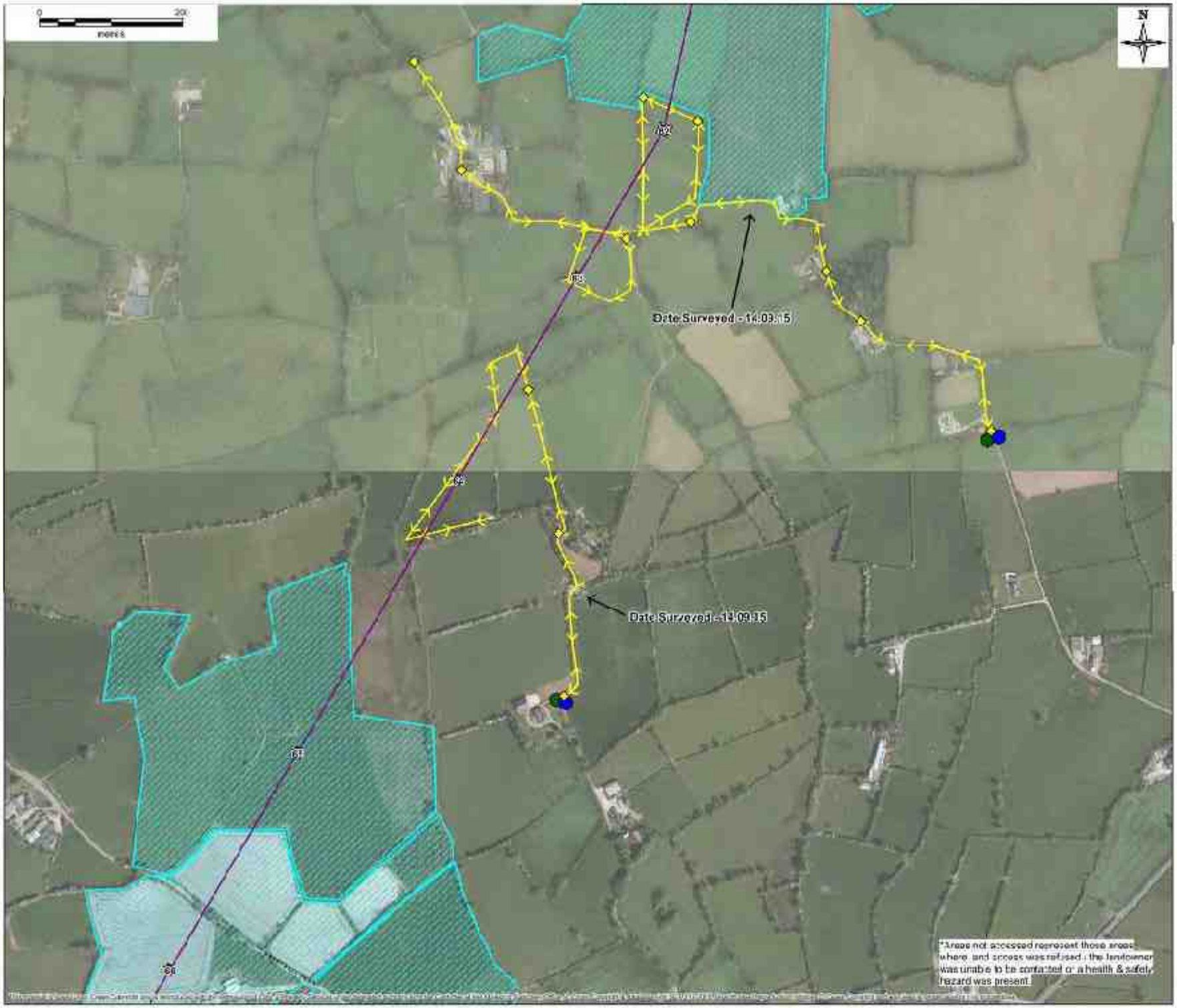


AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Site
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

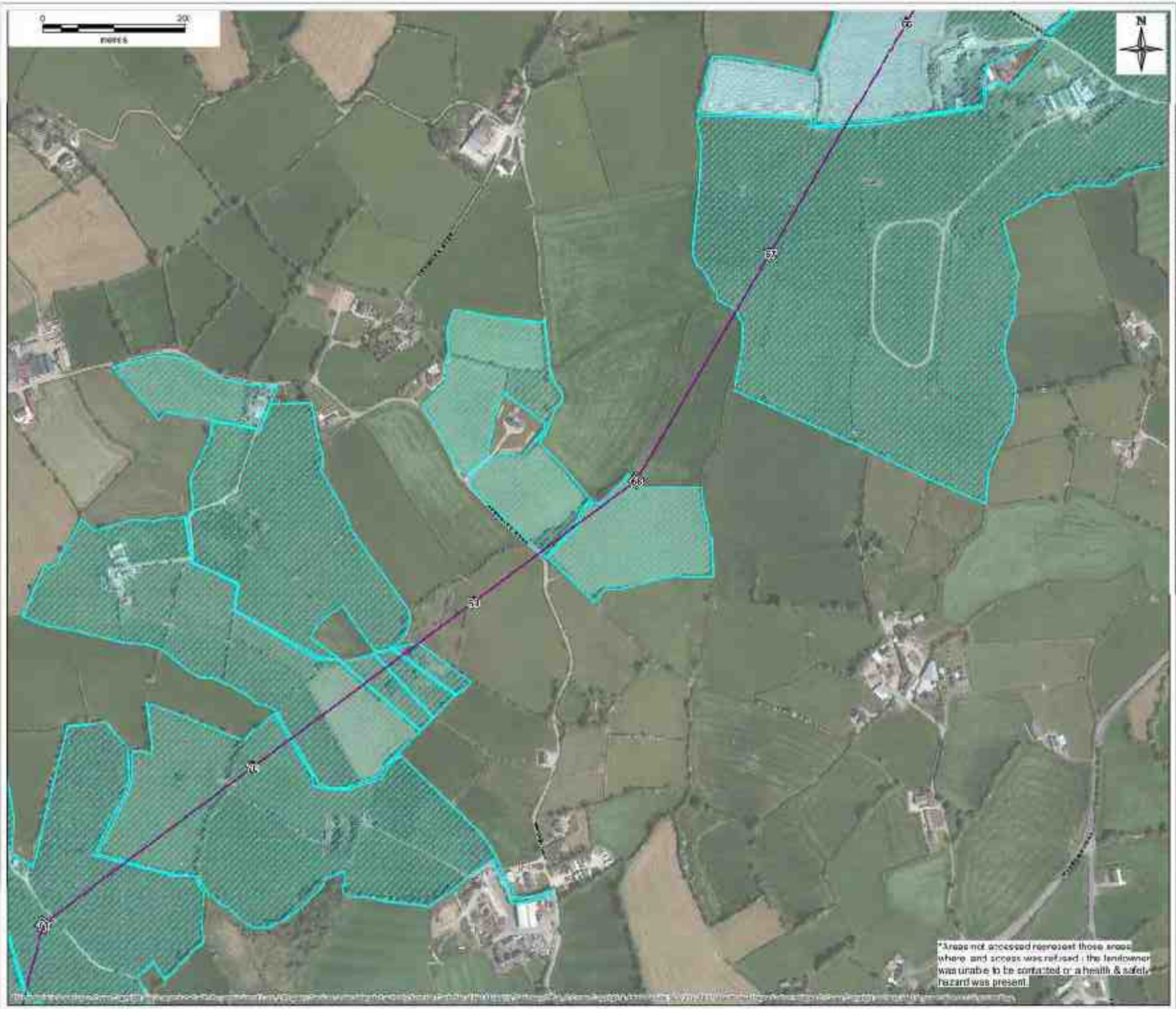
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/30



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

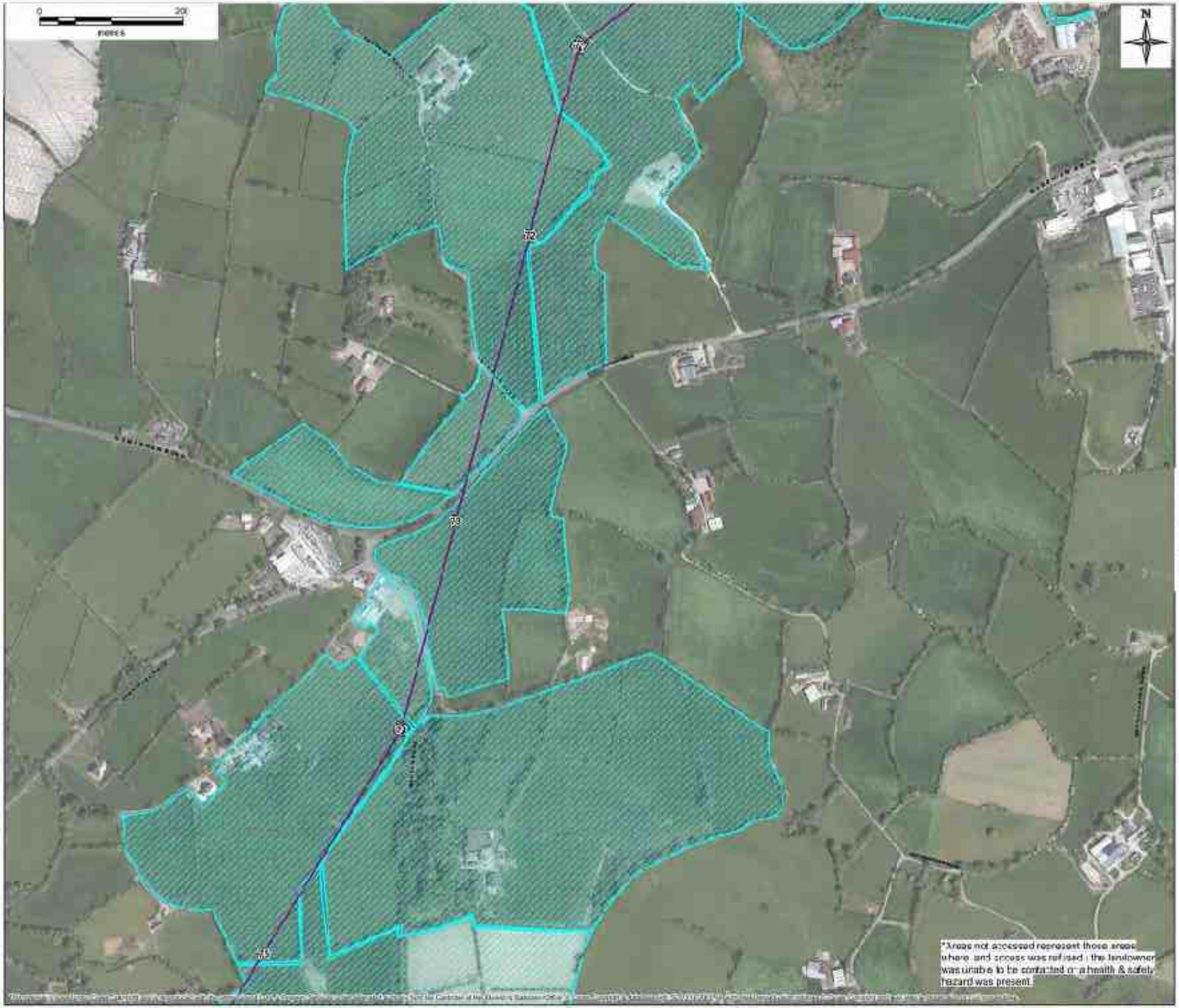
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3P



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

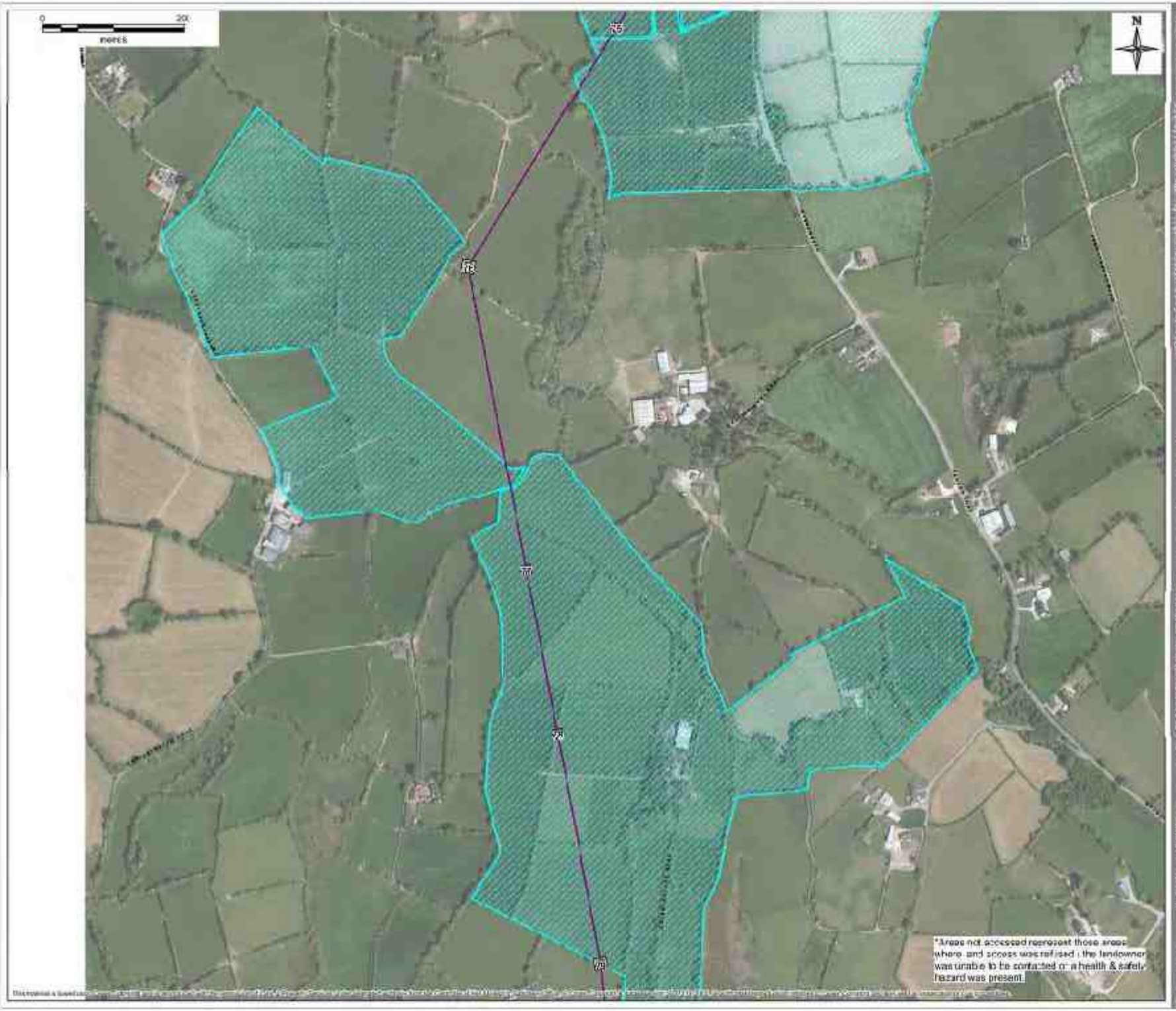
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/30



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

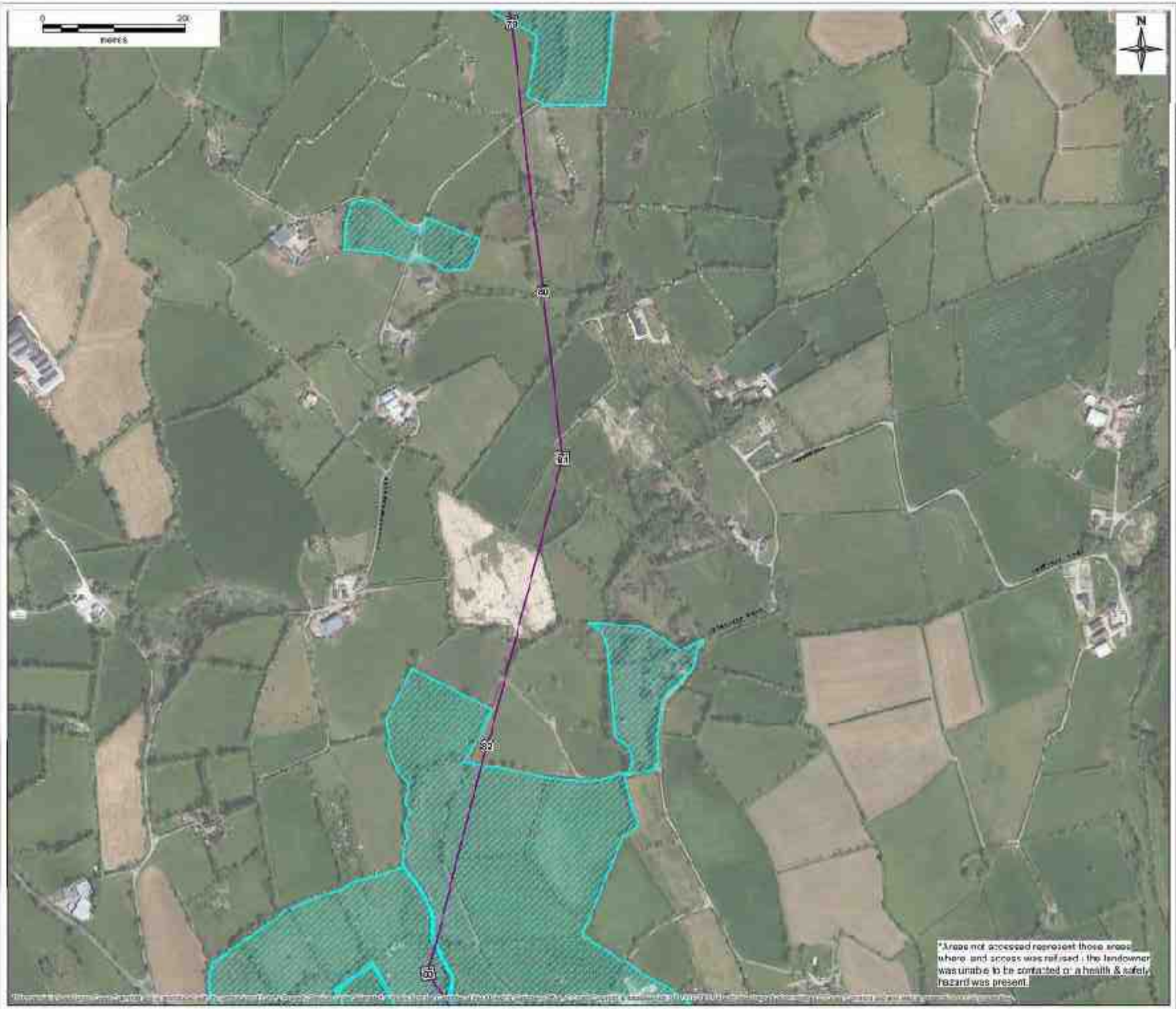
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3R



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Site
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

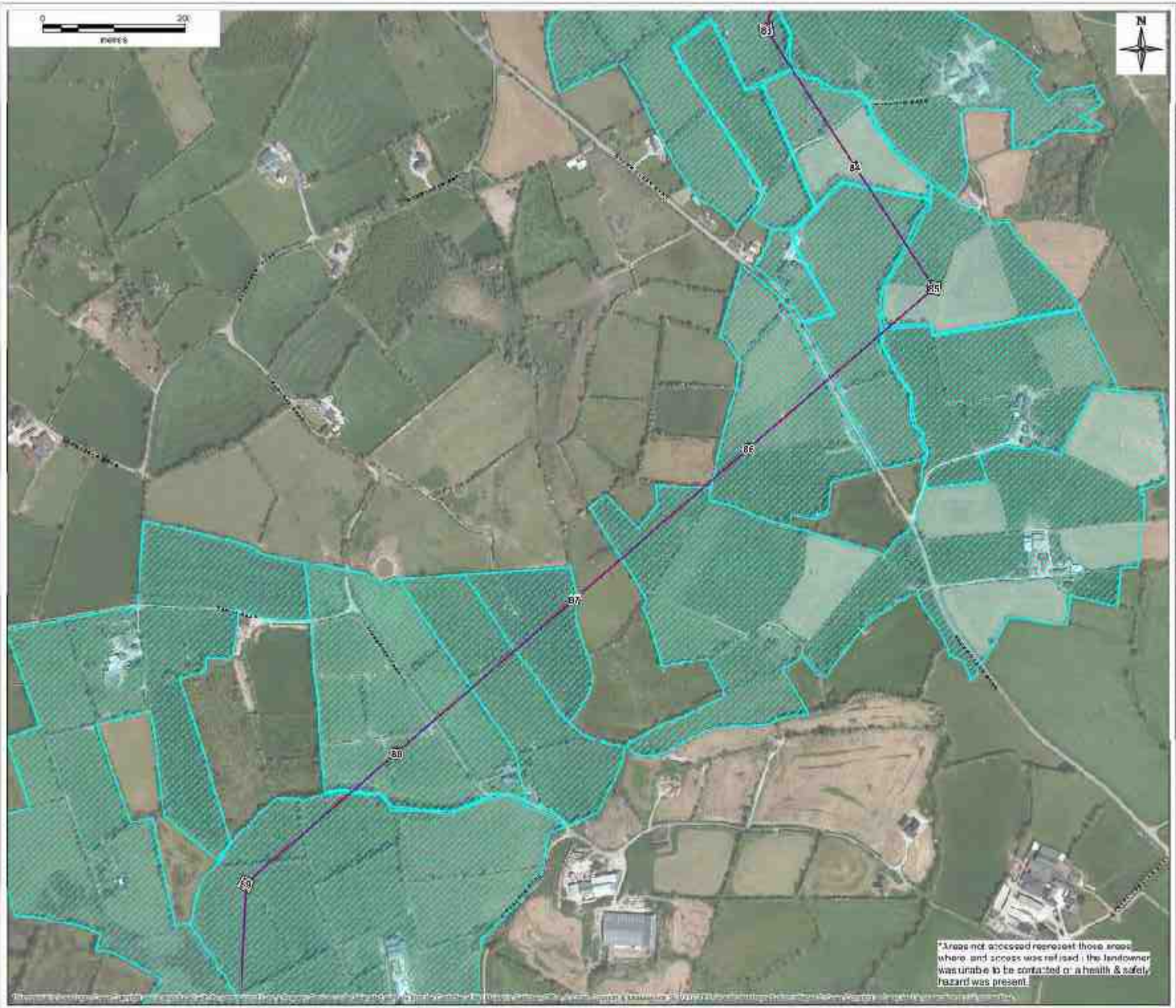
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3S



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

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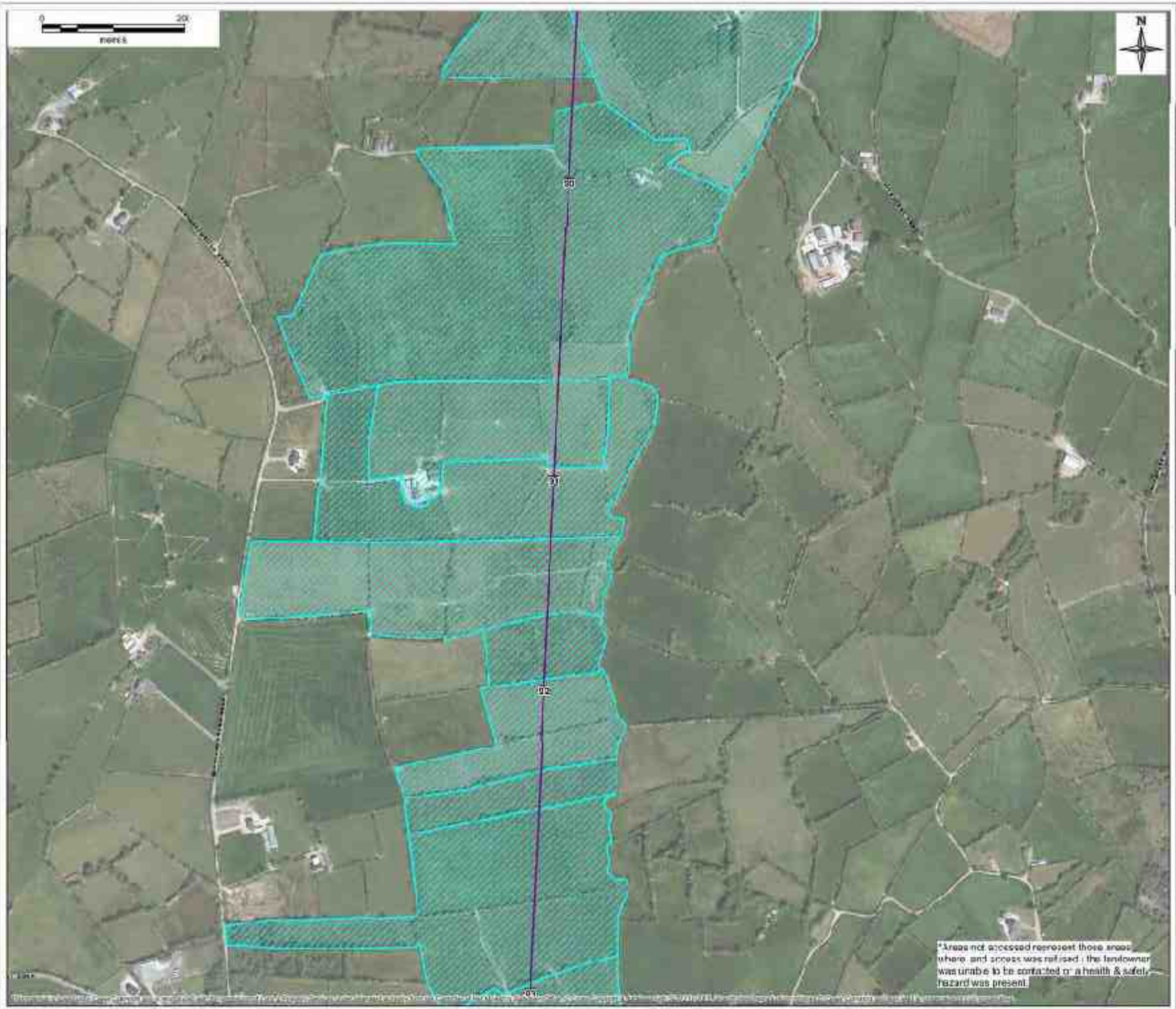


AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Site
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

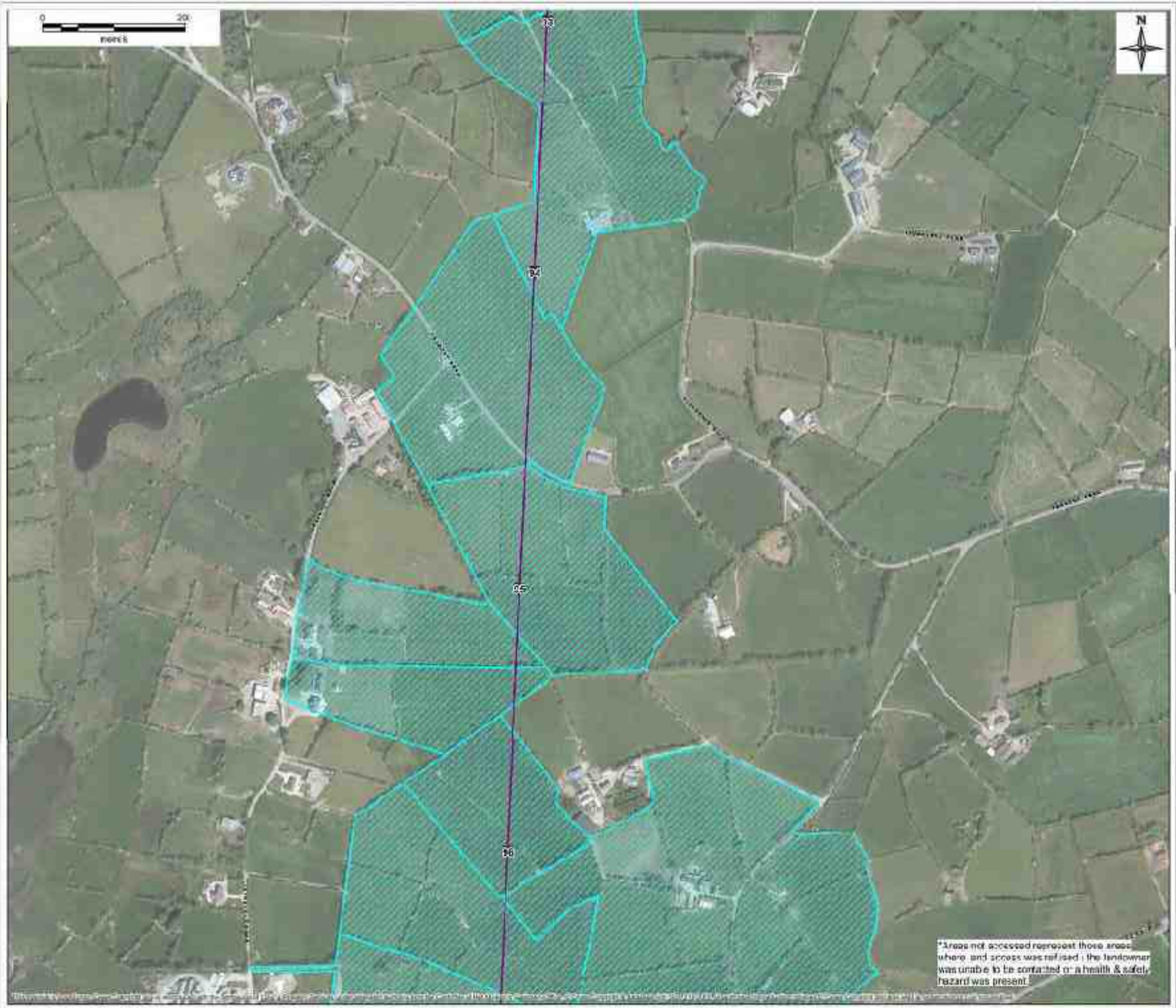
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3U



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Site
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

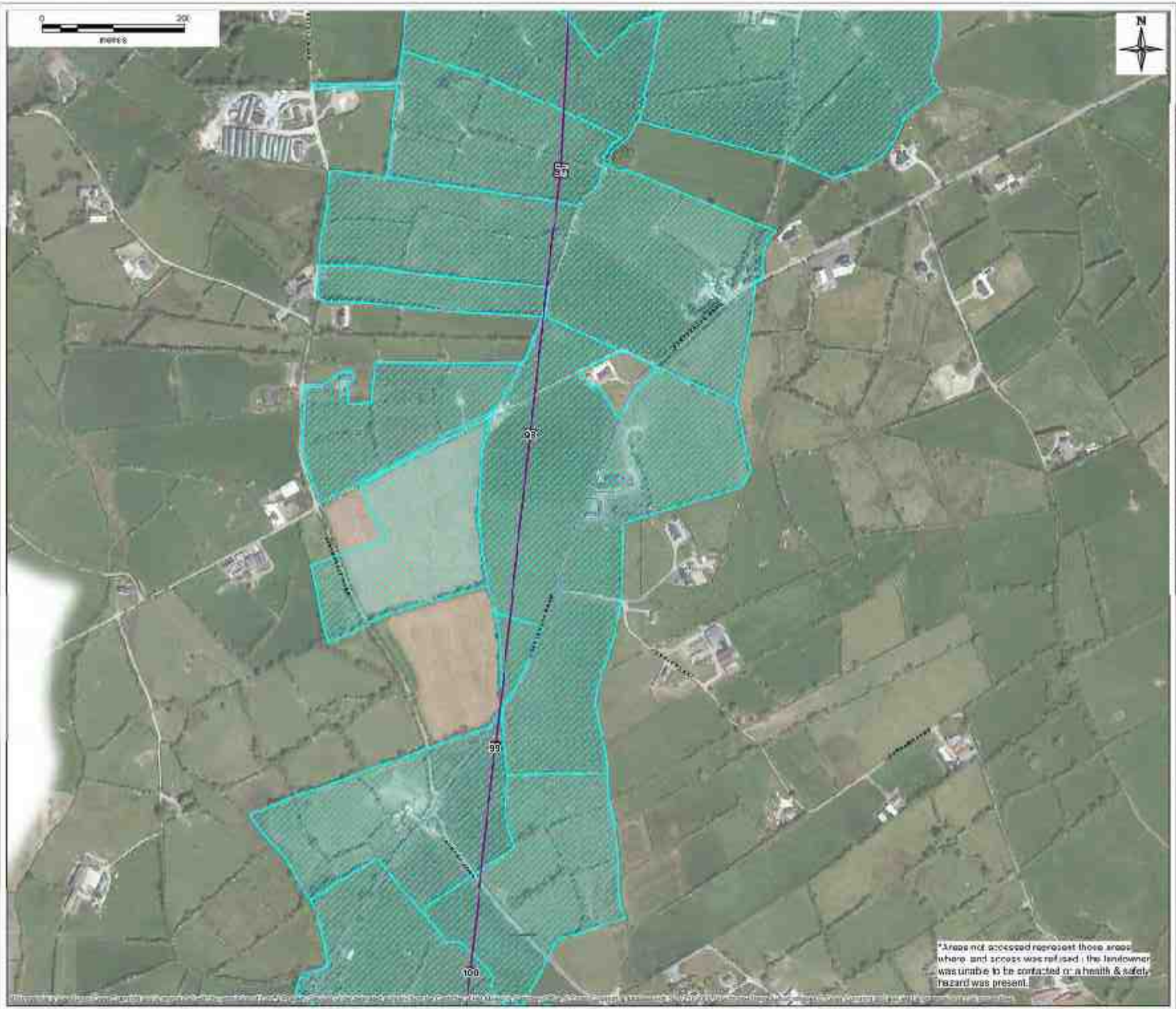
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3V



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

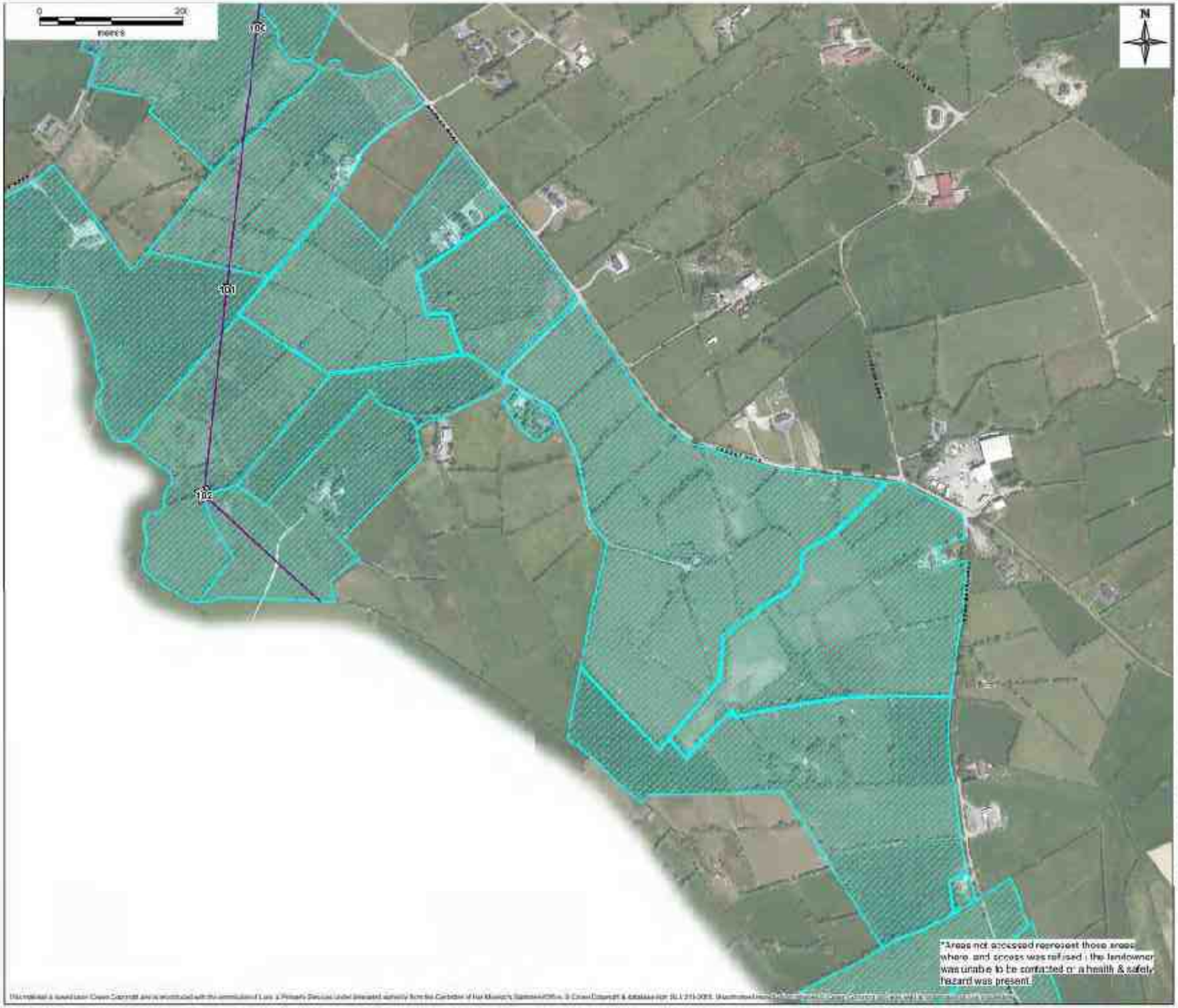
60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3\V



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draw and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

60320996/3528/3X

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

LEGEND

- Proposed Tower and Maximum Tower Size
- Proposed 400kV Overhead Line (Centreline)
- Transect Listening Stops
- Transect Start Point
- Transect End Point
- Bat Transect Walked (including direction of travel)
- Land Not Accessed

REVISIONS

VER	DATE	DESCRIPTION
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DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector Bat Methodology Maps - September 2015

DRAWING NUMBER

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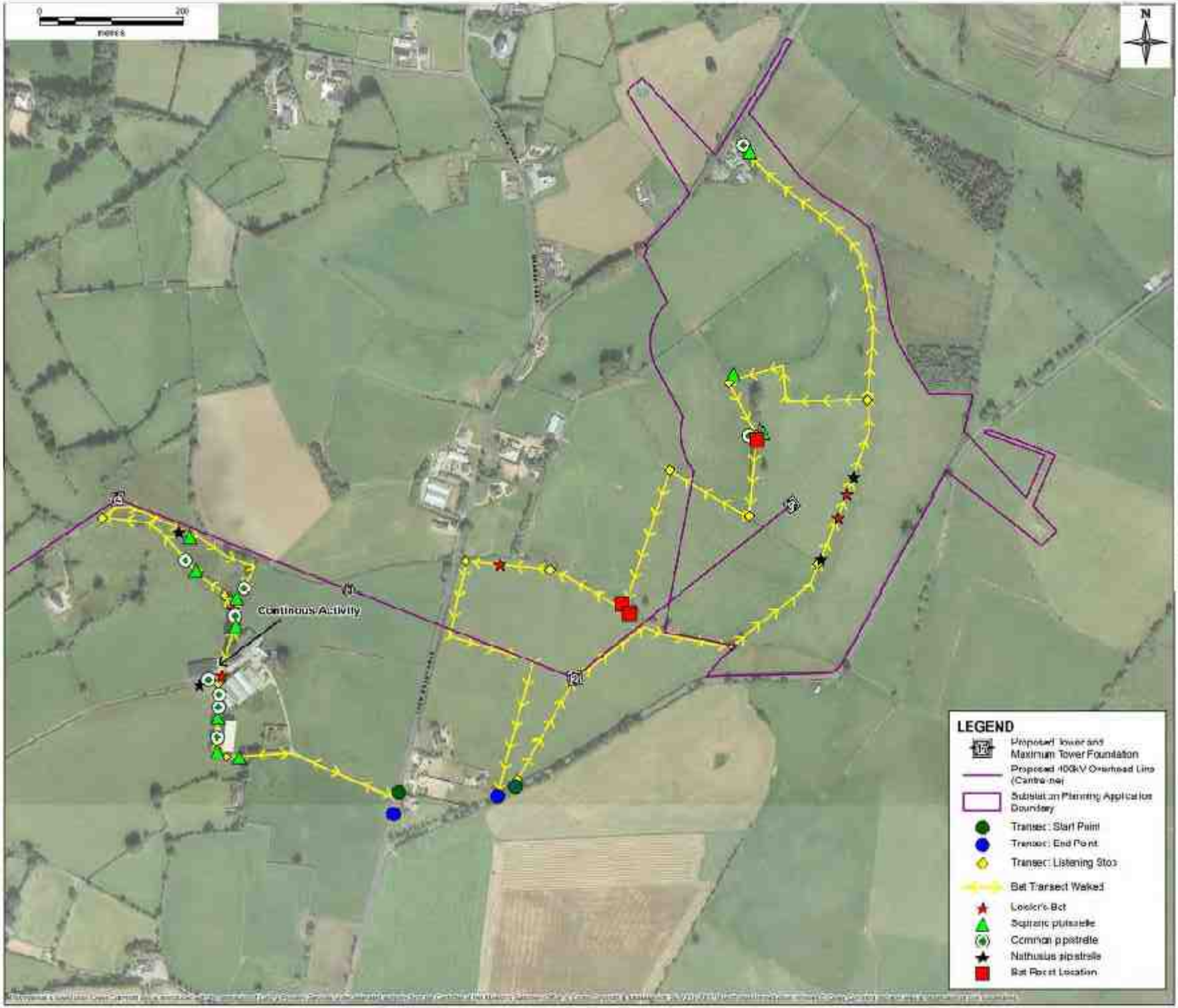


AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

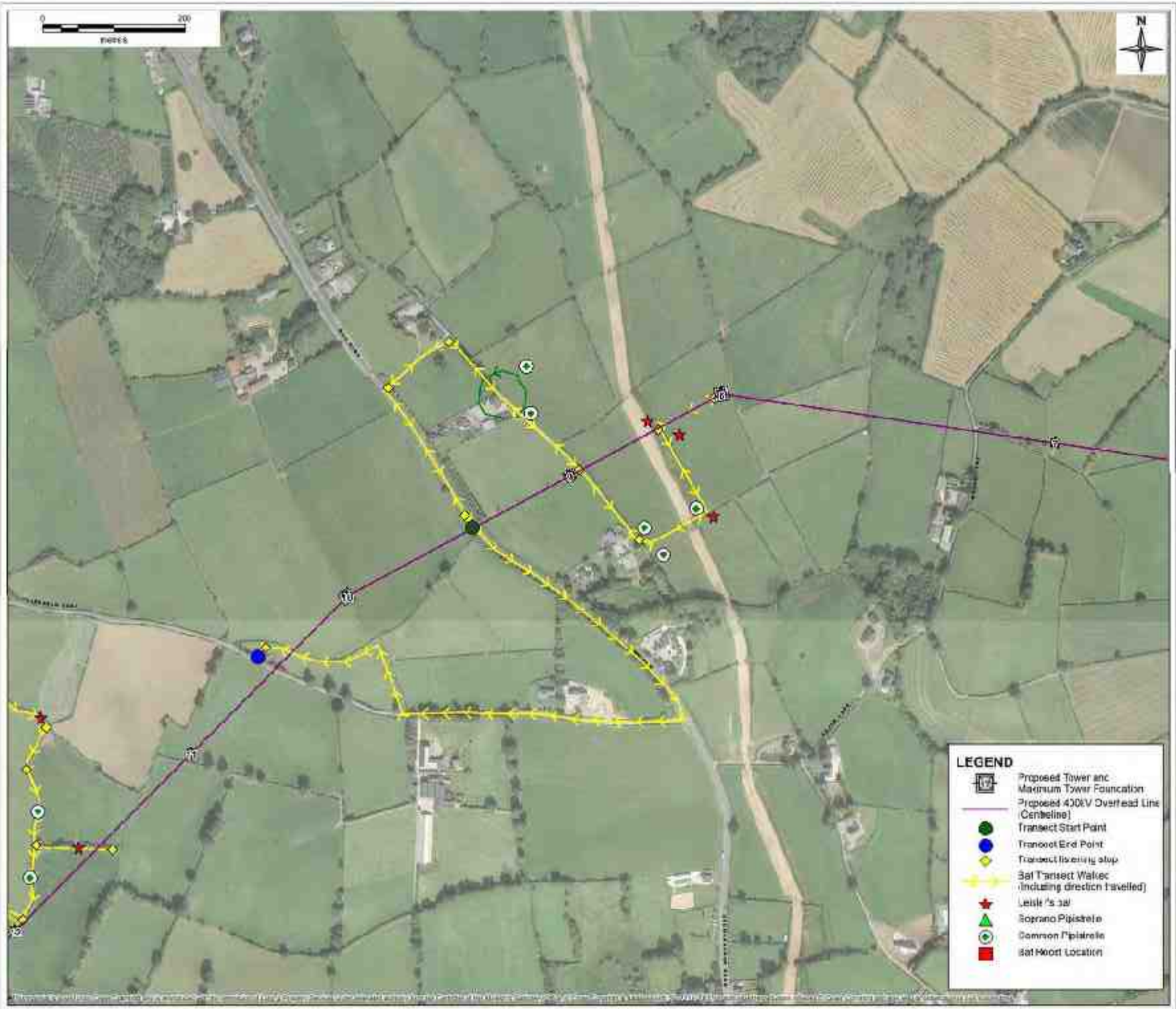
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/4A



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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

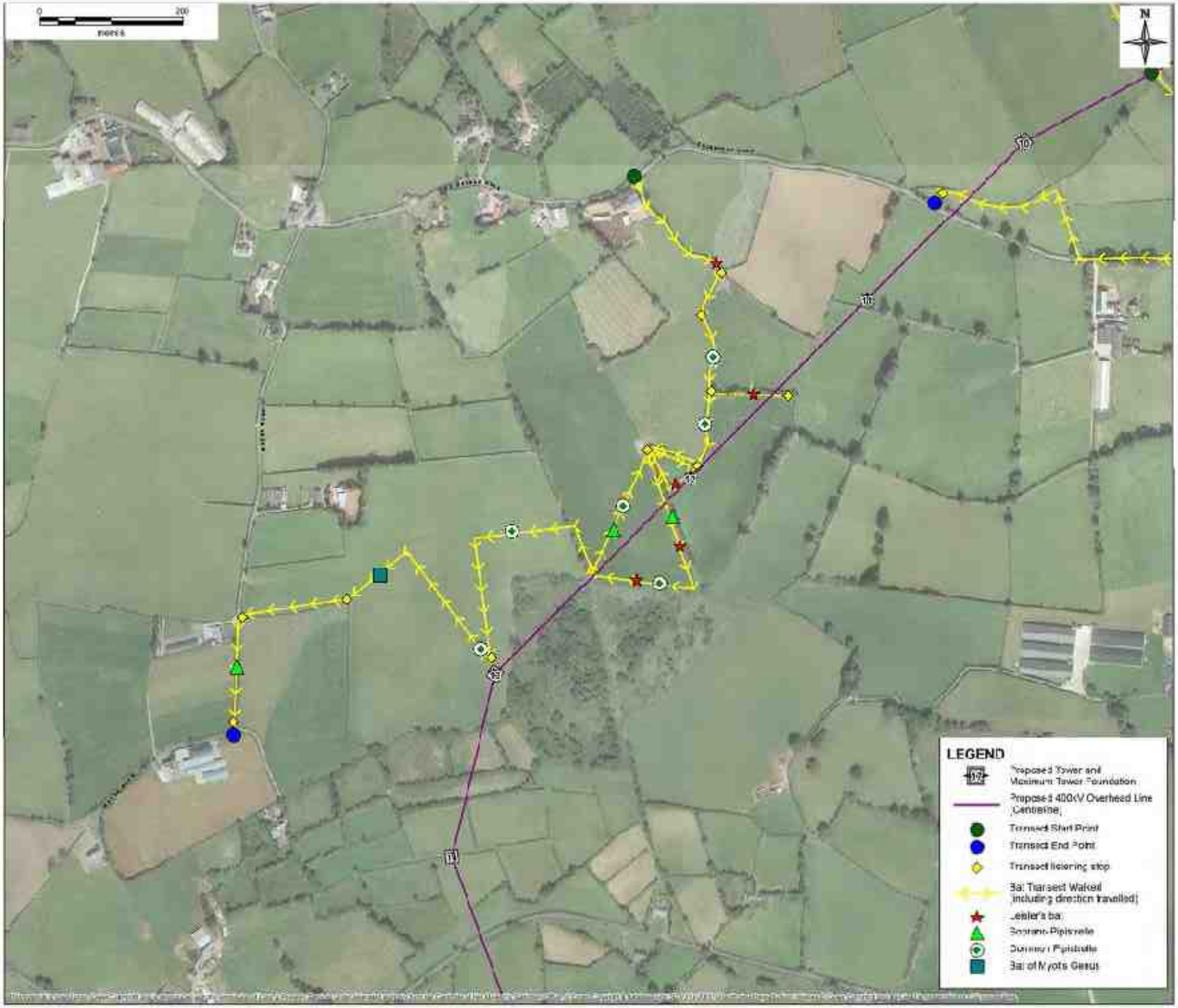
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/48



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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
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DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
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PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

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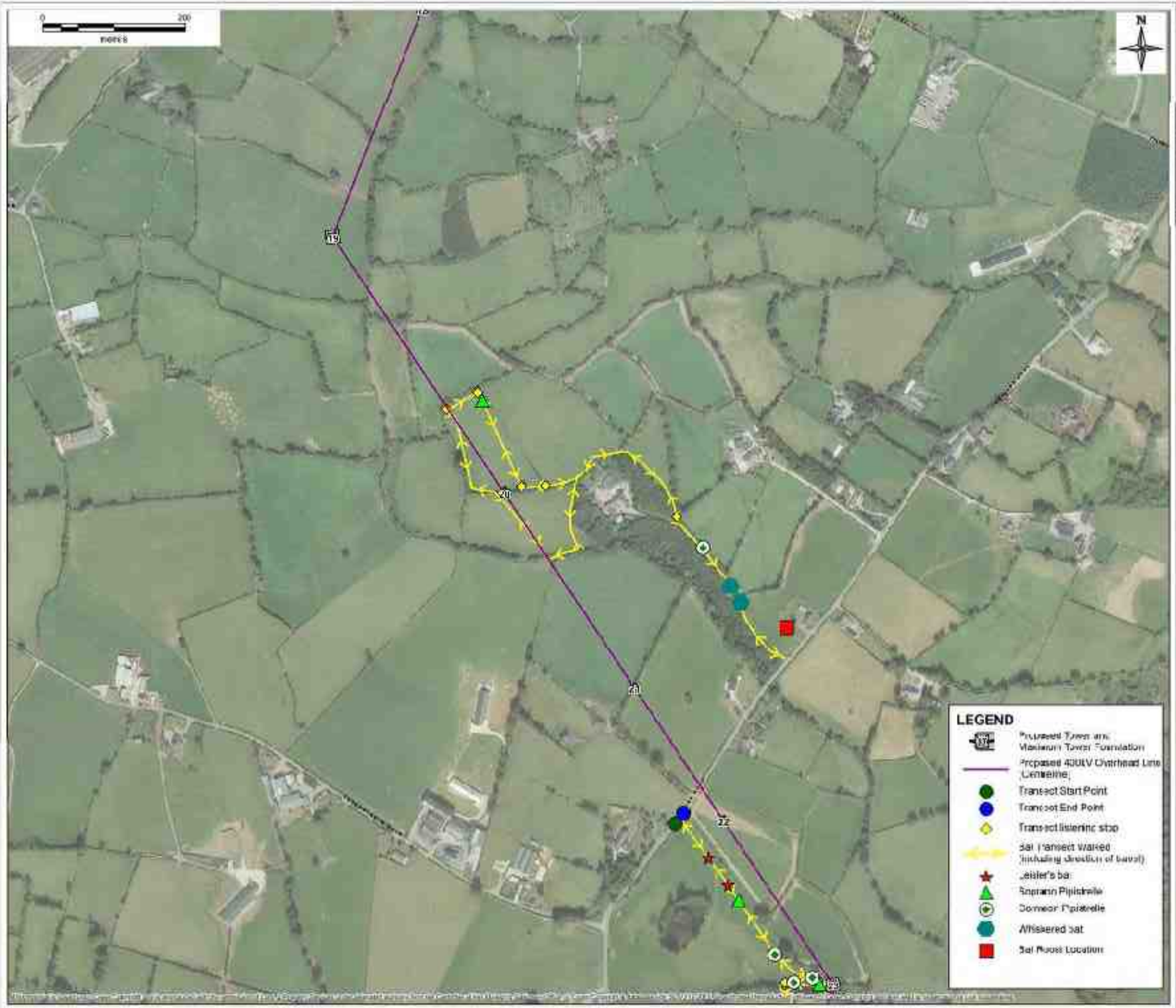

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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
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DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

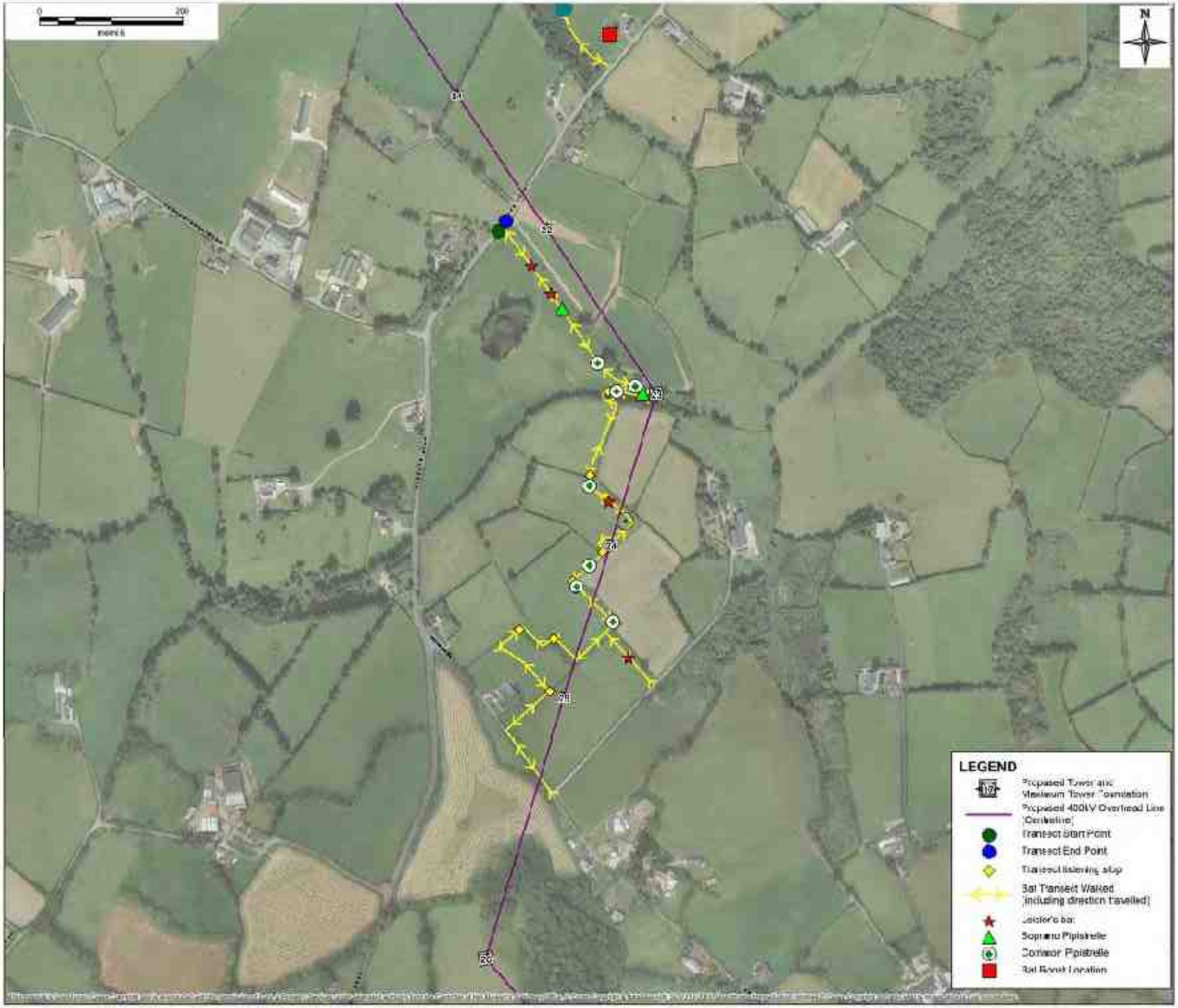
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/4D



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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

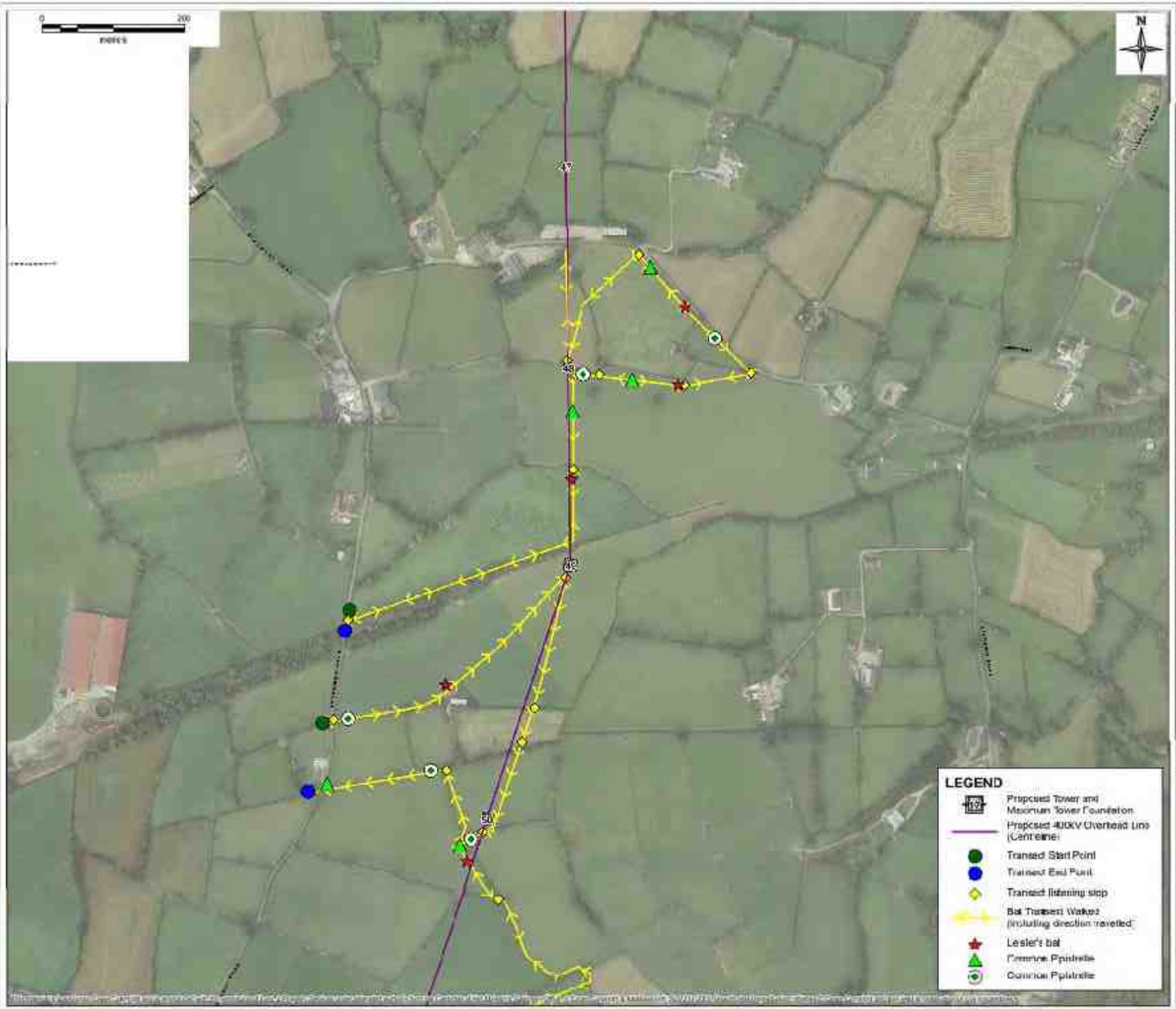
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/4E



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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

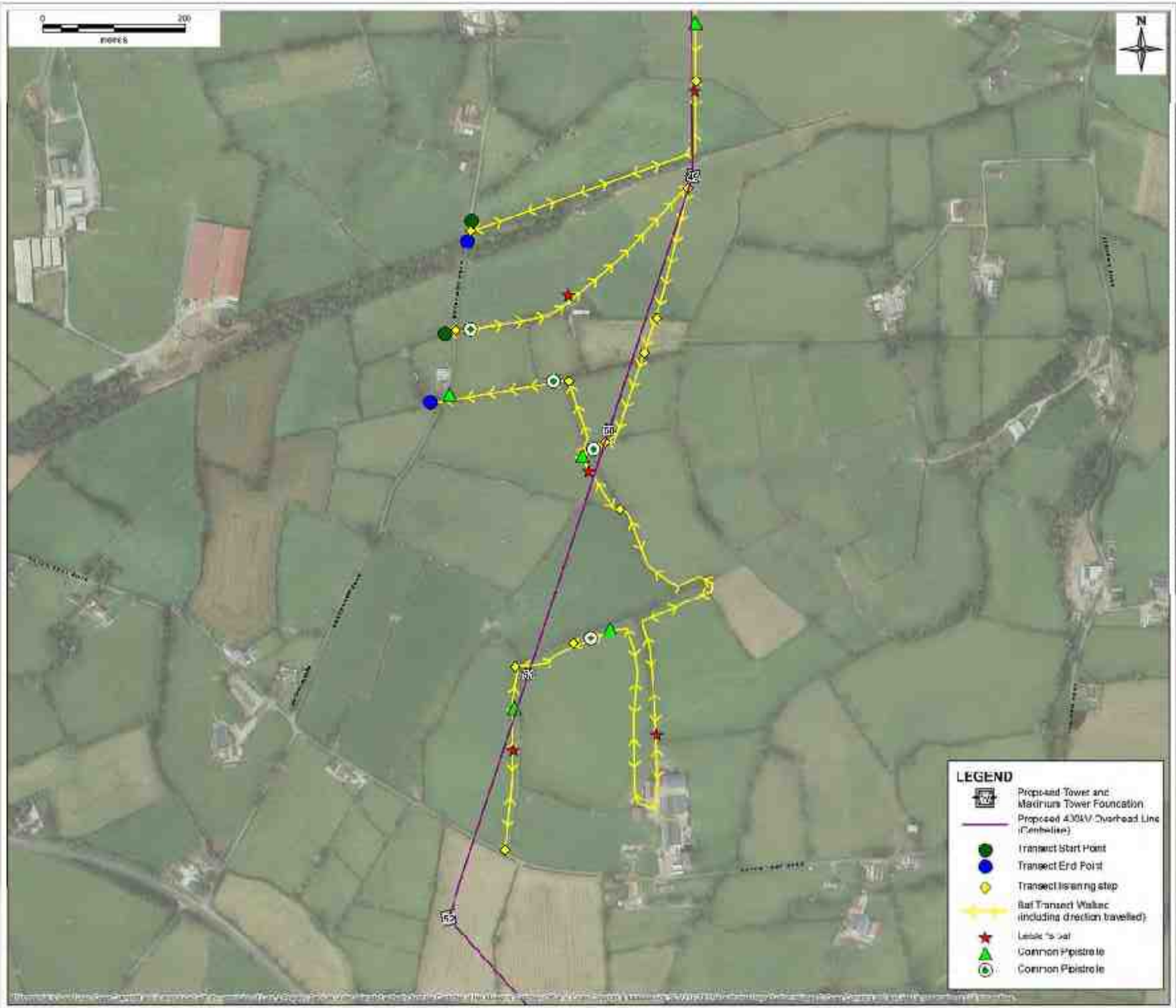
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/4F



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PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

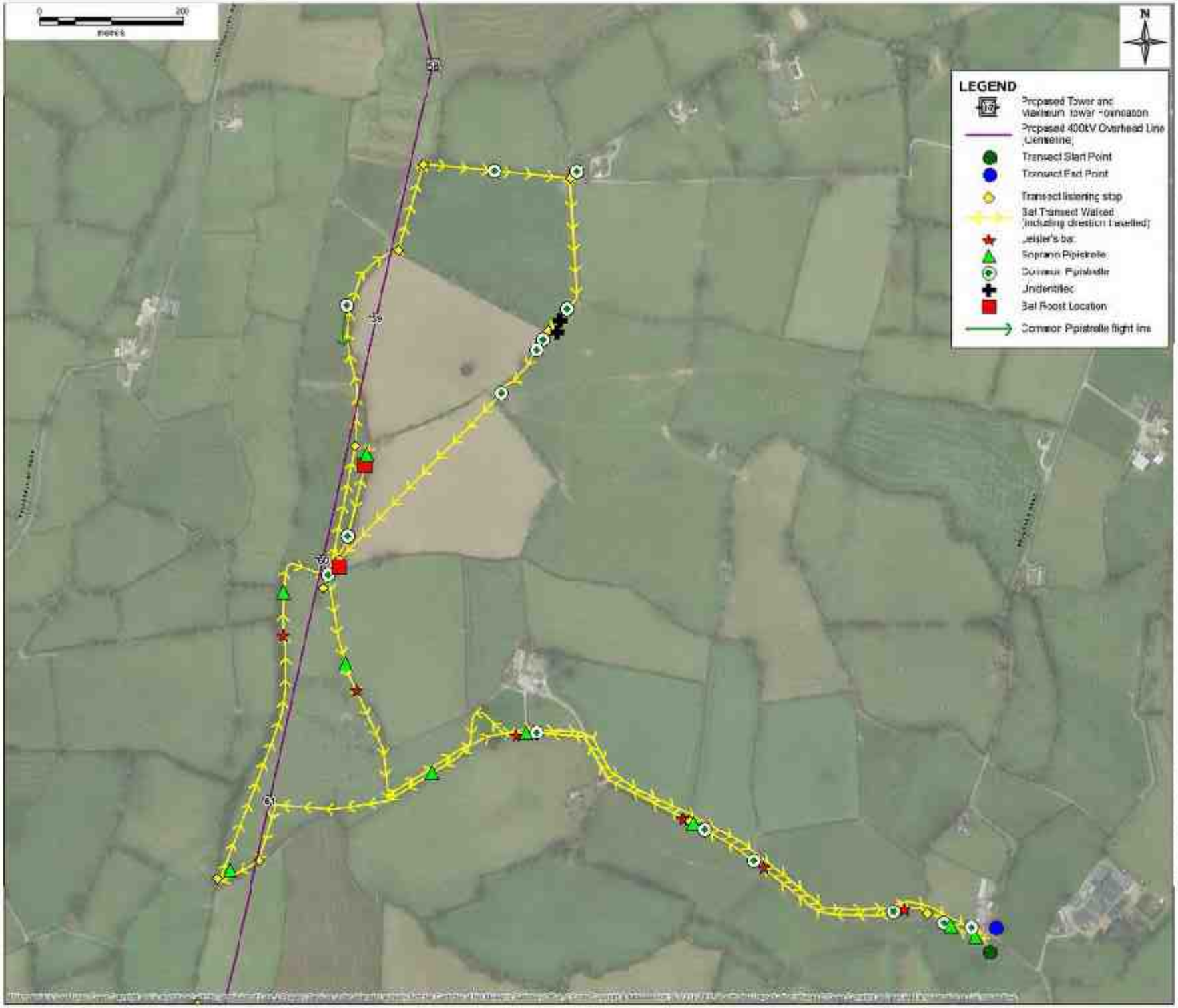
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/4G



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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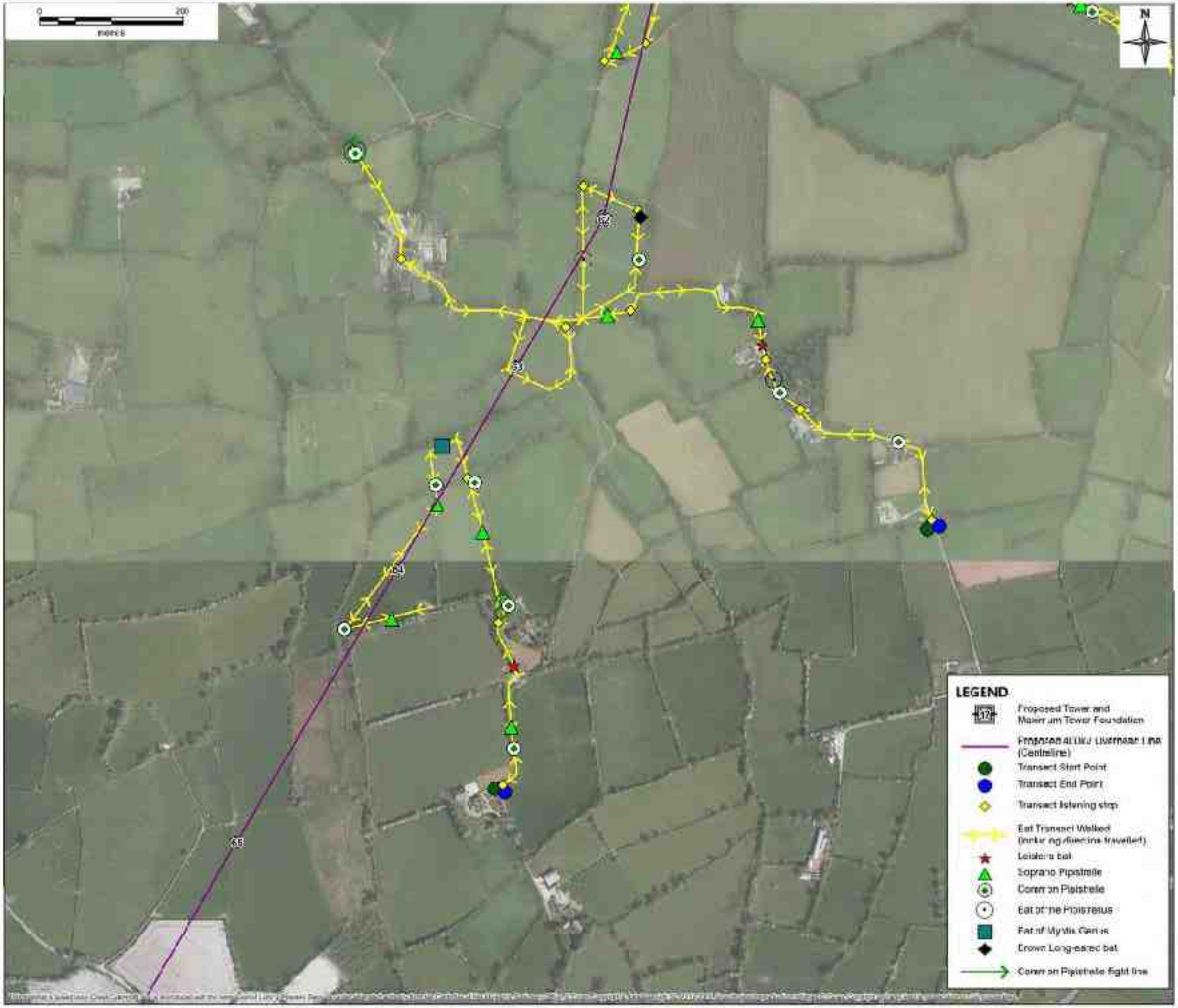
DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/4H



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawings Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2016
SCALE: 1:2000 @ A3

PROJECT NUMBER

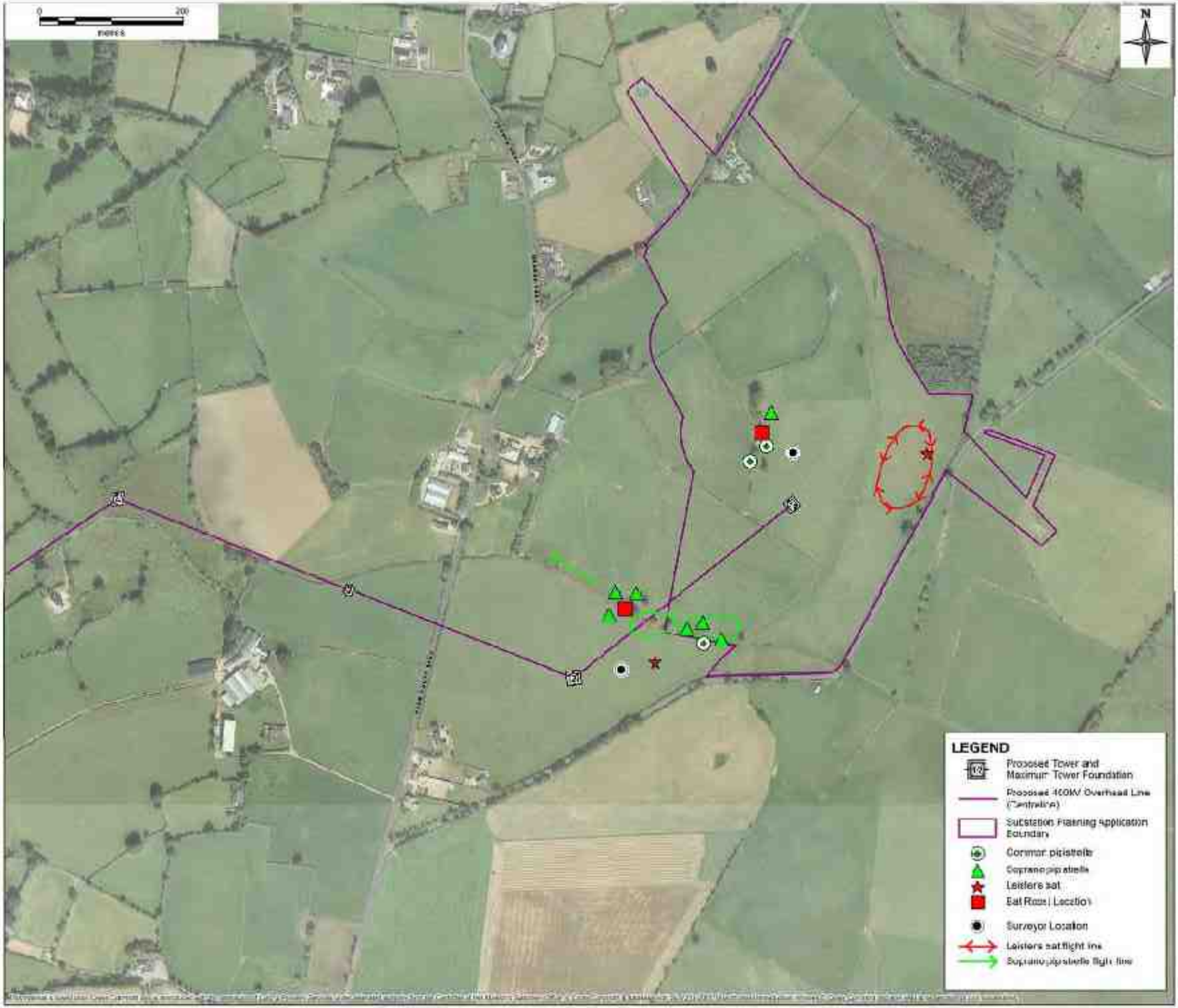
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Activity Maps - September 2015

DRAWING NUMBER

60320996/3528/41



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FL
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Roost Map 30.07.15

DRAWING NUMBER

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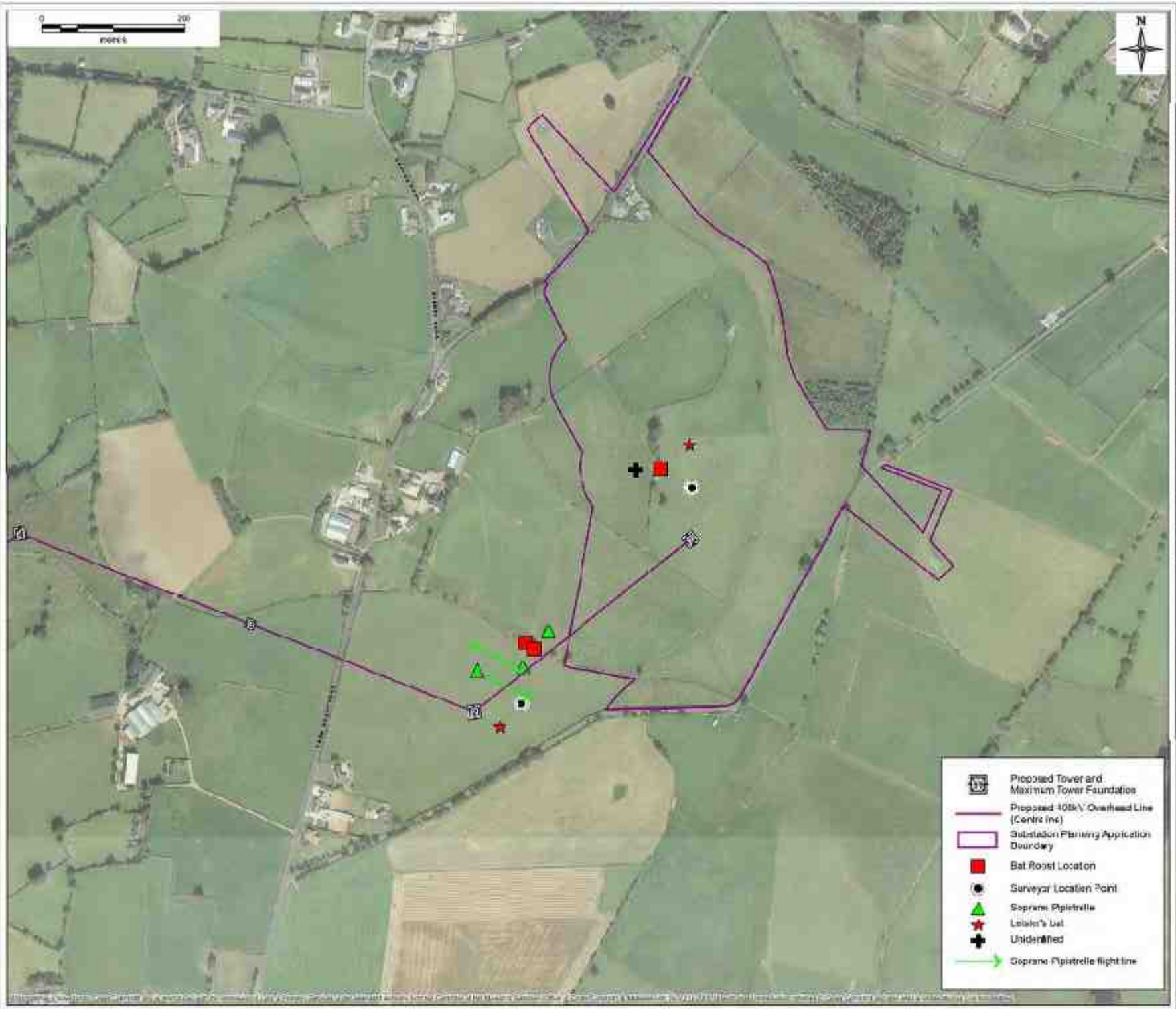

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

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DRAWING TITLE

Tyrone Cavan Interconnector
Bat Roost Map - 31.07.15

DRAWING NUMBER

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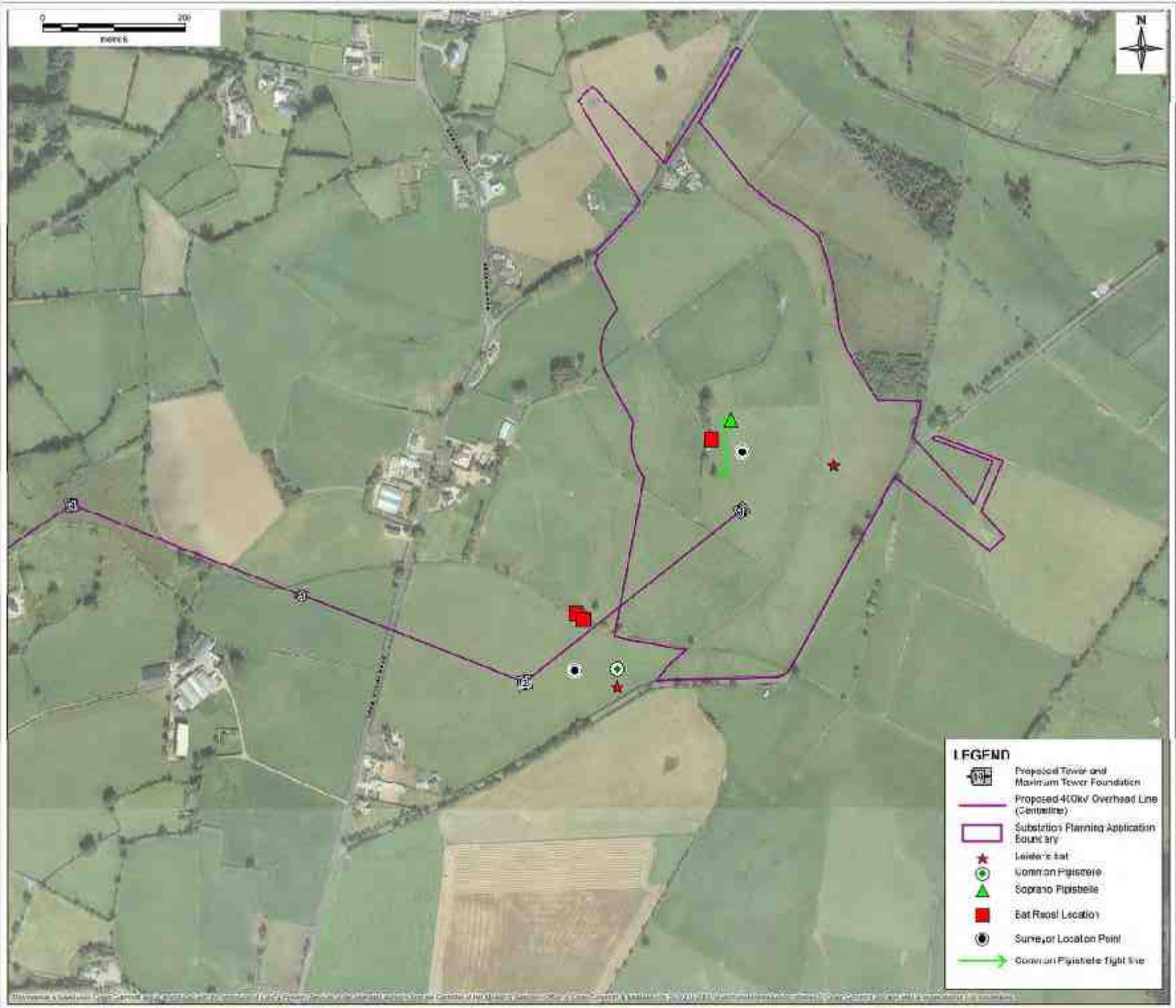


AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Issue Date Draws and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

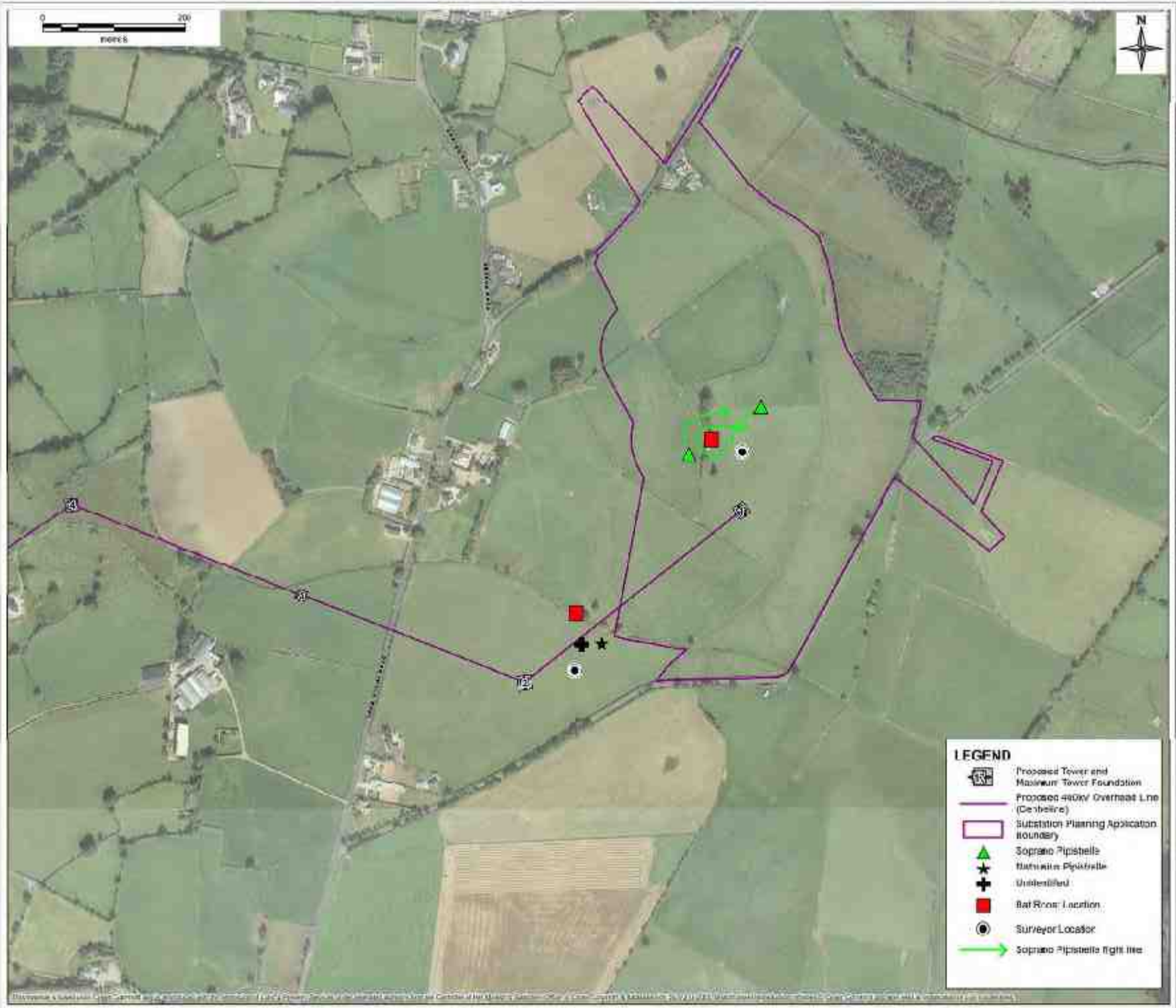
60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Roost Map - 23.09.15

DRAWING NUMBER

60320996/3528/5C



AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Roost Map - 24.09.15 Dawn

DRAWING NUMBER

60320996/3528/5D

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: MM
APPROVED: FLEB
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Roost Map - 24.09.15

DRAWING NUMBER

60320996/3528/5E

AECOM

PROJECT

TYRONE TO CAVAN INTERCONNECTOR

CLIENT

SONI

REVISIONS

VER	DATE	DESCRIPTION
0	25/11/15	Bat Data Drawn and Digitised

DRAWN: JM
CHECKED: FI/FB
APPROVED:
DATE: NOV 2015
SCALE: 1:5000 @ A3

PROJECT NUMBER

60320996

DRAWING TITLE

Tyrone Cavan Interconnector
Bat Roost Map - 25.09.15

DRAWING NUMBER

60320996/3528/5F

Appendix C – Results Tables

Capabilities on project:
Environment

22/07/2015 - Substation

Time	Species	No. of bats	Activity	Notes
22:01	Leisler's bat	2	Commuting	Seen circling field
22:06	Leisler's bat	2	Commuting	Seen circling field
22:08	Soprano pipistrelle	1	Commuting	Heard not seen
22:14	Leisler's bat	1	Commuting	Heard not seen
22:30	Leisler's bat	1	Commuting	Heard not seen
22:32	Leisler's bat	1	Commuting and foraging	Heard not seen and feeding registrations not recorded
22:38	Leisler's bat	1	Commuting	Heard not seen
22:49	Natterers bat	1	Commuting	Heard not seen
22:50	Leisler's bat	1	Commuting	Heard not seen
22:55	Soprano pipistrelle	1	Commuting	Heard not seen
23:06	Common pipistrelle	1	Commuting	Seen commuting at gate.
23:34	Leisler's bat	1	Commuting	Heard not seen

09/09/2015 - Substation

Time	Species	No. of bats	Activity	Notes
20:26	Nathusius pipistrelle	1	Commuting	Heard not seen
20:28	Leisler's bat	1	Commuting	Heard not seen
20:35	Leisler's bat	1	Commuting	Heard not seen
20:42	Nathusius pipistrelle	1	Commuting	Heard not seen at listening stop
21:00	Common pipistrelle	1	Commuting	Heard not seen at listening stop
21:03	Soprano pipistrelle	1	Commuting	Heard not seen at listening stop
21:35	Soprano pipistrelle	1	Commuting	Heard not seen at listening stop beside shed
21:39	Common pipistrelle	1	Commuting	Single tree beside shed
21:57	Leisler's bat	1	Commuting	At treeline close to road

22/07/2015 – T3/T4

Time	Species	No. of bats	Activity	Comment
22:12	Leisler's bat	1	Commuting	Heard not seen
22:22	Leisler's bat	1	Commuting and foraging	Heard not seen
22:29	Common pipistrelle	1	Commuting	Heard not seen
22:30	Common pipistrelle	1	Commuting	Heard not seen
22:31	Common pipistrelle	1	Foraging	Heard not seen
22:35	Soprano pipistrelle	1	Commuting	Heard not seen
22:39	Soprano pipistrelle	1	Commuting	Heard not seen
22:41	Leisler's bat	1	Commuting	Heard not seen

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Comment
22:42	Leisler's bat	1	Commuting	Heard not seen
22:41	Soprano pipistrelle	2	Foraging	Continuous foraging at listening stop
22:42	Common pipistrelle	1	Foraging	Heard not seen
22:46	Common pipistrelle	1	Commuting and foraging	Heard not seen
22:46	Bat of the *Pipistrellus* genus	1	Commuting	Heard not seen
22:49	Soprano pipistrelle	1	Foraging	Continuous foraging along hedge
23:05	Soprano pipistrelle	1	Commuting	Heard at tower base 4
23:11	Soprano pipistrelle	1	Commuting	Heard not seen
23:12	Soprano pipistrelle	1	Commuting	Heard not seen
23:15	Soprano pipistrelle	2	Foraging	Continuous foraging with social calls
23:23	Soprano pipistrelle	1	Commuting and Foraging	Heard not seen
23:23	Common pipistrelle	1	Commuting and Foraging	Heard not seen
23:28	Soprano pipistrelle	1	Commuting	Heard not seen
23:29	Soprano pipistrelle	1	Commuting	Heard not seen
23:32	Soprano pipistrelle	1	Commuting	Heard not seen
23:33	Common pipistrelle	1	Foraging	Heard not seen
23:33	Soprano pipistrelle	1	Foraging	Heard not seen
23:43	Common pipistrelle	1	Foraging	Heard not seen
23:43	Soprano pipistrelle	1	Foraging	Heard not seen
23:44	Common pipistrelle	1	Foraging	Heard not seen
23:45	Common pipistrelle	1	Commuting	Heard not seen

10/09/2015 – T3/T4

Time	Species	No. of bats	Activity	Notes
20:25	Leisler's bat	1	Commuting	Heard not seen
20:42	Common pipistrelle	1	Commuting	Heard not seen
20:48	Nathusius' pipistrelle	1	Commuting	Heard not seen
20:50	Soprano pipistrelle	1	Commuting	Heard not seen
20:54	Leisler's bat	1	Commuting	Heard in tree lined lane
20:55	Common pipistrelle	1	Commuting	Heard in tree lined lane
20:57	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
20:57	Leisler's bat	1	Commuting	Heard in tree lined lane
20:57	Common pipistrelle	1	Commuting	Heard in tree lined lane
20:58 - 21:03	Leisler's bat	1	Commuting and foraging	Heard in tree lined lane
20:59	Common pipistrelle	1	Commuting	Heard in tree lined lane

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
20:59 - 21:02	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:03	Leisler's bat	2	Commuting	Heard between two sheds
21:03	Common pipistrelle	1	Commuting	Heard between two sheds
21:07	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:08	Leisler's bat	1	Commuting	Heard in tree lined lane
21:09	Nathusius' pipistrelle	1	Commuting	Heard in tree lined lane
21:15	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:20	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:22	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:28 - 21:29	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:35	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:35	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:38	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:39	Common pipistrelle	1	Foraging	Heard in tree lined lane
21:39	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:43	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:44	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:45 - 21:27	Common pipistrelle	1	Commuting and foraging	Heard in tree lined lane
21:47	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:47	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:47 - 21:48	Soprano pipistrelle	1	Commuting	Heard in tree lined lane
21:49	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:50	Common pipistrelle	1	Foraging	Heard in tree lined lane
21:53	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:54	Common pipistrelle	1	Commuting	Heard in tree lined lane
21:56	Soprano pipistrelle	1	Commuting	Heard past the gate to the entrance of a building

22/07/2015 – T8-T10

Time	Species	No. of bats	Activity	Notes
22:24	Soprano pipistrelle	1	Commuting	Seen commuting along hedge line to the south of tower 8
22:31 -	Soprano pipistrelle	1	Commuting and foraging	Seen commuting along hedge line to

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
22:32				the east of tower 8
22:34	Leisler's bat	1	Commuting	Seen commuting along hedge line to the east of tower 8
22:42	Common pipistrelle	1	Commuting	Seen commuting along hedge line to the south of tower 8
22:44 - 22:47	Soprano pipistrelle	1	Commuting	Seen commuting along hedge line to the south of tower 8
22:56	Leisler's bat	1	Commuting	Heard not seen
23:03	Common pipistrelle	1	Commuting	Seen commuting along lane to the north of tower 9
23:03	Soprano pipistrelle	1	Commuting	Seen commuting along lane to the north of tower 9
23:04 - 23:07	Common pipistrelle	1	Commuting and foraging	Heard along lane to the north of tower 9
23:07	Leisler's bat	1	Commuting	Heard along lane to the north of tower 9
23:14	Soprano pipistrelle	1	Commuting	Heard not seen at Moy Road
23:28	Soprano pipistrelle	1	Commuting	Heard not seen along hedge in field with Tower 10
23:46	Soprano pipistrelle	1	Commuting	At Culkeeran Road

16/09/2015 – T8-T9

Real time	Species	No. of bats	Activity	Notes
20:29	Common pipistrelle	1	Commuting	north of tower 9
20:29	Common pipistrelle	1	Commuting	north of tower 9
20:30	Common pipistrelle	1	Foraging	north of tower 9
20:41	Common pipistrelle	1	Commuting	Heard not seen
20:45	Leisler's bat	1	Commuting	Heard not seen
20:45	Leisler's bat	1	Commuting	Heard not seen
20:49 - 20:52	Leisler's bat	1	Foraging	Heard not seen
20:55	Leisler's bat	1	Commuting	Heard not seen
21:05	Common pipistrelle	1	Commuting	Heard not seen
21:06	Bat of the *Pipistrellus* genus	1	Commuting	Heard not seen

22/07/2015 – T12–T13

Real time	Species	No. of bats	Activity	Notes
21:52	Leisler's bat	1	Commuting	Heard at over sailed hedge to the east of tower 12

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
21:53	Leisler's bat	1	Commuting	Heard at over sailed hedge to the east of tower 12
21:54	Leisler's bat	1	Commuting	Heard at over sailed hedge to the east of tower 12
21:59 - 22:01	Leisler's bat	1	Commuting	Heard at over sailed hedge to the east of tower 12
22:02 - 22:05	Leisler's bat	1	Commuting	Seen at over sailed hedge to the east of tower 13
22:06	Leisler's bat	1	Commuting	Seen in field to the east of over sailed hedge
22:09 - 22:11	Leisler's bat	1	Commuting	Heard along a path
22:13	Leisler's bat	1	Commuting	Seen at to the north east of Tower 12
21:15 - 22:16	Leisler's bat	1	Commuting	Seen in field to the north of tower 12.
20:17	Leisler's bat	1	Commuting	Seen in field to the north of tower 12.
22:21	Soprano pipistrelle	1	Commuting	Seen commuting down hedge line to south of Tower 12.
22:23 - 22:25	Common pipistrelle	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:25	Soprano pipistrelle	1	Foraging	Heard commuting along a ditch to the south west of tower 12.
22:25	Leisler's bat	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:26 - 22:28	Soprano pipistrelle	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:26	Common pipistrelle	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:27 - 22:29	Leisler's bat	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:28	Common pipistrelle	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:29	*Myotis* spp.	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:29	Common pipistrelle	1	Commuting	Heard commuting along a ditch to the south west of tower 12.
22:31	Soprano pipistrelle	1	Commuting	Heard not seen
22:33	Common pipistrelle	1	Commuting	Heard not seen
22:35 - 22:36	Leisler's bat	1	Commuting	Heard not seen
22:56	Leisler's bat	1	Commuting	Heard not seen
22:56	Soprano pipistrelle	1	Commuting	Heard not seen
23:04	Leisler's bat	1	Commuting	Heard not seen
23:05	Leisler's bat	1	Commuting	Heard along hedge

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
23:06	Soprano pipistrelle	1	Commuting	Heard along hedge
23:09	Leisler's bat	1	Commuting	Heard along hedge
23:09	Soprano pipistrelle	1	Foraging	Heard along hedge
23:14	Common pipistrelle	1	Commuting	Heard not seen along Rhone Road
23:19	Common pipistrelle	1	Commuting	Heard not seen along Rhone Road
23:20	Soprano pipistrelle	1	Commuting	Heard not seen along Rhone Road
23:35	Common pipistrelle	1	Commuting	Heard not seen along Rhone Road
23:48 - 23:49	Common pipistrelle	2	Commuting and foraging	Heard not seen along Rhone Road

16/09/2015 – T12-T13

Real time	Species	No. of bats	Activity	Notes
19:53	Leisler's bat	1	Foraging	Heard not seen
19:54	Leisler's bat	1	Commuting	Heard not seen
20:09	Common pipistrelle	1	Commuting	Heard not seen
20:12 - 20:13	Soprano pipistrelle	1	Commuting	Heard not seen
20:14	Leisler's bat	1	Commuting	Heard not seen
20:14 - 20:15	Soprano pipistrelle	1	Commuting	Heard not seen
20:15	Common pipistrelle	1	Commuting	Heard not seen
20:16 - 20:17	Leisler's bat	1	Commuting and foraging	Heard not seen
20:17 - 20:18	Common pipistrelle	1	Commuting	Heard not seen
20:18	Leisler's bat	1	Commuting	Heard not seen
20:20	Common pipistrelle	1	Commuting	Heard not seen
20:20	Soprano pipistrelle	1	Commuting	Heard not seen
20:32	Common pipistrelle	1	Commuting	Heard not seen
20:32 - 20:33	Common pipistrelle	1	Commuting	Heard not seen
20:35 - 20:37	Common pipistrelle	1	Commuting	Heard not seen
20:38	Soprano pipistrelle	1	Commuting	Along farm track at height of 10m
20:38	*Myotis* spp.	1	Commuting	Heard not seen along farm track
20:38	Common pipistrelle	1	Commuting	Heard at T13 base
20:38 - 20:40	Leisler's bat	1	Commuting	Heard not seen
20:39	Common pipistrelle	1	Commuting	Heard not seen

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
20:40 - 20:41	Common pipistrelle	1	Commuting	Heard not seen
20:42	Leisler's bat	1	Commuting	Heard not seen
20:43 - 20:44	Common pipistrelle	1	Commuting	Heard not seen
20:44	Soprano pipistrelle	1	Commuting	Heard not seen
20:46	Common pipistrelle	1	Commuting	Heard not seen
20:48	Common pipistrelle	1	Commuting	Heard not seen
20:51	Common pipistrelle	1	Commuting	Heard not seen
20:54	Leisler's bat	1	Commuting	Heard not seen
21:00	Common pipistrelle	1	Commuting	Heard not seen
21:03	Common pipistrelle	1	Commuting	Heard not seen
21:09	Soprano pipistrelle	1	Commuting	Heard not seen
21:11	Common pipistrelle	1	Commuting	Heard not seen
21:13	Common pipistrelle	1	Commuting	Heard not seen
21:18	Leisler's bat	1	Commuting	Heard not seen
21:27	Leisler's bat	1	Commuting	Heard not seen

29/07/2015 – T20 – T25

Real time	Species	No. of bats	Activity	Notes
21:50	Common pipistrelle	1	Commuting	Emerged from farm building/granny flat
21:51	Common pipistrelle	1	Commuting	Emerged from farm building/granny flat
21:52	Common pipistrelle	1	Commuting	Emerged from farm building/granny flat
21:54	Common pipistrelle	1	Commuting	Emerged from farm building/granny flat
21:56	Common pipistrelle	1	Commuting	Emerged from farm building/granny flat
22:00	Common pipistrelle	1	Commuting	Emerged from farm building/granny flat
22:01	Common pipistrelle	1	Commuting	Emerged from farm building/granny flat
22:05	Common pipistrelle	1	Foraging	Wooded lane
22:06	Common pipistrelle	1	Commuting	Wooded lane
22:06	Soprano pipistrelle	1	Commuting	Wooded lane
22:09	Soprano pipistrelle	1	Commuting and foraging	Wooded lane
22:10	Common pipistrelle	1	Commuting	Wooded lane
22:11	Common pipistrelle	1	Commuting	Wooded lane
22:13	Common pipistrelle	1	Commuting	Wooded lane
22:20	Common pipistrelle	1	Commuting	Woodland around building
22:21	Common pipistrelle	1	Commuting	Woodland around building

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
22:22	Common pipistrelle	1	Commuting	Along fenceline
22:27	Soprano pipistrelle	1	Commuting	Tower 20
22:37	Common pipistrelle	1	Commuting	By river
22:42	Soprano pipistrelle	1	Commuting	Along fenceline
22:47	Soprano pipistrelle	1	Commuting	Along fenceline
22:49	Soprano pipistrelle	1	Commuting	Along fenceline
22:56	Common pipistrelle	1	Commuting	Between towers 19 and 20, in corner of field
22:56	Soprano pipistrelle	1	Commuting	Between towers 19 and 20, in corner of field
22:57	Common pipistrelle	1	Commuting and foraging	Between towers 19 and 20, in corner of field
23:10	Soprano pipistrelle	1	Commuting	Trees around farm
23:12	Soprano pipistrelle	1	Commuting	Trees by river
23:13	Common pipistrelle	1	Commuting	Trees by river
23:14	Soprano pipistrelle	1	Commuting	Trees by river
23:16	Common pipistrelle	1	Commuting	Trees by river
23:16	Soprano pipistrelle	1	Commuting	Trees by river
23:17	Soprano pipistrelle	1	Commuting	Trees by river
23:15	Common pipistrelle	1	Commuting	In field
23:15	Soprano pipistrelle	1	Commuting	In field
23:23	Nathusius' pipistrelle	1	Commuting	Crossed river

16/09/2015 T20-T23

Time	Species	No of bats	Activity	Notes
20:07	Leisler's bat	1	Commuting	Heard not seen at tree line
20:10	Leisler's bat	1	Commuting and foraging	Heard not seen at tree line
20:21	Common pipistrelle	1	Commuting	Heard not seen at junction of road and laneway
20:22	Common pipistrelle	1	Commuting	Heard not seen along the laneway.
20:24	Common pipistrelle	1	Commuting	Seen flying along laneway at 3m.
20:42	Soprano pipistrelle	1	Commuting	Heard not seen along the laneway.
21:10	Whiskered bat	2	Commuting	Heard not seen along the laneway.
21:18	Common pipistrelle	1	Commuting	Heard not seen along the laneway.
21:21	Common pipistrelle	1	Commuting	Heard not seen along the laneway.
21:24	Common pipistrelle	1	Commuting and foraging	Heard not seen along the laneway.

28/09/2015 – T23-T25

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
21:04	Leisler's bat	1	Commuting	Heard not seen
21:09	Common pipistrelle	1	Commuting	Heard not seen
21:10	Common pipistrelle	1	Commuting	Heard not seen at listening stop
21:10	Common pipistrelle	1	Commuting	Heard not seen
21:19	Common pipistrelle	1	Commuting	Heard not seen at listening stop
21:25	Bat of the *Pipistrellus* genus	1	Commuting	Heard not seen at listening stop
21:28	Leisler's bat	1	Commuting	Heard not seen at listening stop
21:41	Common pipistrelle	1	Commuting	Heard not seen at listening stop
21:43	Common pipistrelle	1	Commuting	Heard not seen at listening stop
21:53	Common pipistrelle	1	Commuting	Heard not seen at stream
21:54	Soprano pipistrelle	1	Commuting	Heard not seen at listening stop
21:56	Common pipistrelle	1	Commuting	Heard not seen at listening stop
22:04	Common pipistrelle	1	Commuting	Heard not seen at listening stop
22:05	Common pipistrelle	1	Commuting	Heard not seen at listening stop
22:08	Common pipistrelle	1	Commuting	Foraging around tree for two minutes.
22:08	Soprano pipistrelle	1	Commuting and social call	Commuting at tree for three minutes

29/07/2015 – T48

Time	Species	No. of bats	Activity	Notes
22:15	Common pipistrelle	1	Commuting	Heard not seen
22:17	Soprano pipistrelle	1	Commuting	Heard not seen
22:17	Leisler's bat	2	Commuting	Heard not seen
22:18	Soprano pipistrelle	1	Commuting	Heard not seen
22:18	Soprano pipistrelle	1	Commuting	Heard not seen
22:21 - 22:23	Leisler's bat	1	Commuting and foraging	Heard not seen
22:21 - 22:23	Soprano pipistrelle	1	Commuting and foraging	Heard not seen
22:23	Leisler's bat	1	Commuting	Heard not seen
22:24	Soprano pipistrelle	1	Commuting	Heard not seen
22:24	Common pipistrelle	1	Commuting	Heard not seen
22:24	Soprano pipistrelle	1	Foraging	Heard not seen
22:27	Leisler's bat	1	Commuting	Heard not seen
22:27	Soprano pipistrelle	1	Commuting and foraging	Heard not seen
22:33	Soprano pipistrelle	1	Commuting	Heard not seen
22:37	Common pipistrelle	1	Commuting	Heard not seen
22:38	Soprano pipistrelle	1	Commuting	Heard not seen

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
22:44	Soprano pipistrelle	1	Commuting	Heard not seen
22:46	Soprano pipistrelle	1	Commuting	Heard not seen
22:48	Common pipistrelle	1	Commuting	Heard not seen
23:12	Common pipistrelle	1	Commuting	Heard not seen
23:25	Soprano pipistrelle	1	Commuting	Heard not seen

15/09/2015 – T48

Real time	Species	No. of bats	Activity	Notes
20:33	Soprano pipistrelle	1	Foraging	Heard not seen
20:35	Common pipistrelle	1	Commuting and foraging	Heard not seen
20:36 - 20:27	Soprano pipistrelle	1	Commuting and foraging	Heard not seen, continuous for 30 seconds
20:37	Soprano pipistrelle	1	Foraging	Heard not seen
20:38	Leisler's bat	1	Commuting	Heard not seen
20:40	Leisler's bat	1	Commuting	Heard not seen
20:41	Leisler's bat	1	Commuting	Heard not seen
20:46	Common pipistrelle	1	Commuting	Heard not seen
20:50	Leisler's bat	1	Commuting	Heard not seen
21:03	Soprano pipistrelle	1	Commuting	Heard not seen
21:03	Common pipistrelle	1	Commuting	Heard not seen
21:10	Leisler's bat	1	Commuting	Heard not seen
21:29	Common pipistrelle	1	Commuting	Heard not seen
21:34	Leisler's bat	1	Commuting	Heard not seen

29.07.2015 – T49-T51

Time	Species	No. of bats	Activity	Notes
21:54	Leisler's bat	1	Commuting	Came from north of transect and circled field
21:56	Leisler's bat	1	Foraging	Circling field along transect route
21:59	Leisler's bat	1	Foraging	Circling field along transect route
22:00	Leisler's bat	2	Foraging	Circling field along transect route
22:02	Leisler's bat	2	Foraging	Circling field along transect route
22:04	Leisler's bat	2	Foraging	Circling field along transect route
22:05	Leisler's bat	3	Foraging	Circling field along transect route
22:07	Leisler's bat	3	foraging	Circling field
22:09	Leisler's bat	1	Foraging	Corner of field
22:11	Leisler's bat	1	Commuting	Heard not seen

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
22:16	Soprano pipistrelle	1	Commuting	Heard not seen
22:18	Soprano pipistrelle	1	Commuting	Flying over the field
22:18	Common pipistrelle	1	Commuting	Flying over the field
22:20	Common pipistrelle	1	Foraging	Flying around tree line at field
22:24	Common pipistrelle	3	Foraging	Flying along hedgeline
22:27	Soprano pipistrelle	1	Foraging	Along tree line
22:30	Leisler's bat	1	Commuting	Heard not seen
22:30	Soprano pipistrelle	1	Commuting	Heard not seen
22:37	Leisler's bat	1	Commuting	Heard not seen
22:40	Soprano pipistrelle	1	Commuting	Heard not seen
22:42	Common pipistrelle	1	Commuting	Heard not seen
22:44	Common pipistrelle	1	Commuting	Heard not seen
22:45	Common pipistrelle	1	Commuting	Heard not seen
22:46	Common pipistrelle	1	Commuting	At trees in corner
22:48	Soprano pipistrelle	1	Commuting and Foraging	Heard not seen
22:55 - 22:56	Common pipistrelle	1	Commuting and Foraging	Heard not seen
23:06	Common pipistrelle	1	Commuting	Listening stop at north western part of site.
23:17	Common pipistrelle	1	Foraging	Heard at a shed but not seen
23:22	Common pipistrelle	1	Commuting	Heard not seen
23:23	Common pipistrelle	2	Commuting and foraging	Heard not seen
23:34	Common pipistrelle	1	Commuting	Heard not seen

15.09.2015 – T49-T51

Real time	Species	No. of bats	Activity	Notes
20:15	Common pipistrelle	1	Commuting	Heard not seen
20:15	Soprano pipistrelle	1	Commuting	Heard not seen
20:19	Common pipistrelle	1	Commuting	Heard not seen
20:23	Leisler's bat	1	Commuting	Heard not seen
20:37	Leisler's bat	1	Commuting	Heard not seen
20:38	Leisler's bat	1	Commuting	Heard not seen
20:40	Soprano pipistrelle	1	Commuting and foraging	Heard not seen
20:40	Soprano pipistrelle	1	Foraging	Heard not seen
20:41	Leisler's bat	1	Commuting	Heard not seen
20:41	Soprano pipistrelle	1	Commuting	Heard not seen
20:42	Soprano pipistrelle	1	Commuting	Heard not seen

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
20:45 - 20:48	Soprano pipistrelle	1	Commuting and foraging	Heard not seen
20:45	Common pipistrelle	1	Commuting	Heard not seen
20:47	Leisler's bat	1	Commuting	Heard not seen
20:50	Soprano pipistrelle	1	Commuting	Heard not seen
20:50	Leisler's bat	1	Commuting	Heard not seen
20:51	Leisler's bat	1	Commuting	Heard not seen
20:54	Soprano pipistrelle	1	Foraging	Heard not seen
20:57 - 20:59	Leisler's bat	1	Commuting	Heard not seen
20:59	Soprano pipistrelle	1	Commuting	Heard not seen
21:08	Common pipistrelle	1	Commuting	Heard not seen
21:16	Soprano pipistrelle	1	Commuting	Heard from south of field with tower 50
21:25	Leisler's bat	1	Commuting	Heard from listening stop in field with tower 50
21:28	Common pipistrelle	1	Commuting	Heard from listening stop in field with tower 50
21:33	Common pipistrelle	1	Commuting	Heard from listening stop in field with tower 50
21:34	Common pipistrelle	1	Commuting	Heard from listening stop in field with tower 50

25/07/2015 – T59-T60

Time	Species	No. of bats	Activity	Notes
21:55	Common pipistrelle	1	Emergence	From tree roost east of T60
21:55	Common pipistrelle	1	Commuting	Flying from treeline to the east of T60
21:58 - 21:59	Common pipistrelle	1	Commuting	Flying from treeline to the east of T60
22:02	Common pipistrelle	1	Commuting	Along hedge line
22:07	Leisler's bat	1	Commuting	Heard not seen
22:09	Common pipistrelle	1	Foraging	Along hedge line
22:09	Bat of the *Pipistrellus* genus	1	Foraging	Along hedge line
22:10	Common pipistrelle	1	Foraging	Along hedge line
22:13	Leisler's bat	1	Commuting	Heard not seen

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
22:14	Leisler's bat	1	Commuting	Heard not seen
22:15	Common pipistrelle	1	Commuting	Heard not seen
22:16	Leisler's bat	1	Commuting	Heard not seen
22:18	Leisler's bat	1	Commuting	Heard not seen
22:26	Common pipistrelle	1	Commuting	Heard not seen
22:35	Common pipistrelle	1	Commuting	Heard not seen
22:35-22:36	Soprano pipistrelle	1	Commuting	Heard not seen
22:45 - 22:48	Common pipistrelle	1	Foraging	Heard not seen
22:50	Common pipistrelle	1	Foraging	Heard not seen
22:51	Common pipistrelle	1	Foraging	Heard not seen
23:18	Common pipistrelle	1	Commuting	Heard not seen
23:25	Common pipistrelle	1	Commuting	Heard not seen
23:34	Common pipistrelle	1	Commuting	Heard not seen
23:36	Common pipistrelle	1	Commuting	Heard not seen
23:39	Common pipistrelle	1	Commuting	Heard not seen
23:40	Common pipistrelle	1	Commuting	Heard not seen

15/09/2015 – T59-T60

Time	Species	No. of bats	Activity	Notes
20:07	Soprano pipistrelle	1	Emergence	From roost in tree to the east of T60
20:24	Common pipistrelle	1	Social call	Seen flying along tree line to the west of tower 59
20:37	Common pipistrelle	1	Commuting	Heard not seen at listening stop
20:39	Common pipistrelle	1	Commuting	Heard not seen
20:40	Common pipistrelle	1	Commuting	Heard not seen
20:42	Common pipistrelle	1	Commuting	Heard not seen
20:46	Common pipistrelle	1	Commuting	Heard not seen at listening stop

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
20:48 - 20:49	Common pipistrelle	1	Commuting	Heard not seen at listening stop
20:52 - 20:35	Common pipistrelle	1	Commuting	Heard not seen at listening stop
20:55	Common pipistrelle	1	Commuting	Heard not seen at listening stop
20:57	Unidentified bat	1	Social call	Heard not seen at listening stop
20:58	Leisler's bat	1	Commuting	Heard not seen at listening stop
20:59	Common pipistrelle	1	Commuting	Heard not seen at listening stop
21:01	Common pipistrelle	1	Commuting	Heard not seen at listening stop
21:02	Common pipistrelle	1	Commuting	Heard not seen along access track
21:04	Common pipistrelle	1	Commuting	Heard not seen along access track
21:08	Unidentified bat	1	Social call	Heard not seen along access track
21:09	Leisler's bat	1	Commuting	Heard not seen at listening stop
21:11	Common pipistrelle	1	Commuting and Social calls	Heard not seen at listening stop
21:13	Leisler's bat	1	Commuting	Heard not seen at listening stop
21:35	Soprano pipistrelle	1	Commuting and Social calls	Heard not seen at listening stop to the east of T60
21:43	Common pipistrelle	1	Commuting and Social calls	Heard not seen at listening stop

24/07/2015 – T61

Time	Species	No. of bats	Activity	Notes
22:32	Leisler's bat	1	Commuting	Heard not seen
22:37	Soprano pipistrelle	1	Commuting	Heard not seen
22:41	Leisler's bat	1	Commuting	Heard not seen to the east of tower 61
22:41	Common pipistrelle	1	Commuting	Heard not seen
22:43	Common pipistrelle	1	Commuting	Heard not seen
22:45	Common pipistrelle	1	Commuting	Heard not seen
22:46	Common pipistrelle	1	Foraging	Heard not seen
22:47	Common pipistrelle	1	Commuting	Heard not seen
22:48	Common pipistrelle	1	Commuting	Heard not seen
22:48	Common pipistrelle	1	Commuting	Heard not seen
22:53	Common pipistrelle	1	Commuting	Heard not seen
22:55	Common pipistrelle	1	Commuting	Heard not seen
23:07	Common pipistrelle	1	Commuting	Heard not seen
23:30	Common pipistrelle	1	Foraging	Heard not seen to the west of tower 61
23:31	Common pipistrelle	1	Foraging	Heard not seen to the west of tower 61

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
23:32	Common pipistrelle	1	Foraging	Heard not seen to the west of tower 61
23:32	Common pipistrelle	1	Foraging	Heard not seen to the west of tower 61
23:33	Common pipistrelle	1	Commuting	Heard not seen to the west of tower 61
23:33	Common pipistrelle	1	Commuting	Heard not seen to the west of tower 61
23:33	Soprano pipistrelle	1	Foraging	Heard not seen to the west of tower 61
23:34	Soprano pipistrelle	1	Foraging	Heard not seen to the west of tower 61
23:34	Soprano pipistrelle	1	Foraging	Heard not seen to the west of tower 61
23:35	Soprano pipistrelle	1	Foraging	Heard not seen to the west of tower 61

14/09/2015 – T61

Real time	Species	No. of bats	Activity	Notes
20:02	Soprano pipistrelle	1	Commuting	Heard not seen
20:18	Leisler's bat	1	Commuting	Heard not seen
20:16	Soprano pipistrelle	1	Commuting	Heard not seen
20:17	Soprano pipistrelle	1	Commuting	Heard not seen
20:20	Soprano pipistrelle	1	Commuting	Heard not seen
20:30	Common pipistrelle	1	Commuting	Heard not seen
20:32	Soprano pipistrelle	1	Commuting	Heard not seen
20:32	Leisler's bat	1	Commuting	Heard not seen
20:32 - 20:35	Soprano pipistrelle	1	Commuting and foraging	Heard not seen
20:38	Soprano pipistrelle	1	Foraging	Heard not seen
20:39	Common pipistrelle	1	Commuting	Heard not seen
20:46	Soprano pipistrelle	1	Commuting	Heard not seen
20:51	Soprano pipistrelle	1	Foraging	Heard not seen
20:54	Leisler's bat	1	Commuting	Heard not seen
20:57	Common pipistrelle	1	Commuting	Heard not seen
20:57	Soprano pipistrelle	1	Commuting	Heard not seen
20:58	Leisler's bat	1	Commuting	Heard not seen
20:58	Soprano pipistrelle	1	Commuting	Heard not seen
21:04	Leisler's bat	1	Commuting	Heard not seen
21:04	Soprano pipistrelle	1	Commuting	Heard not seen
21:07	Common pipistrelle	1	Commuting	Heard not seen
21:08 - 21:11	Common pipistrelle	1	Commuting	Heard not seen
21:09	Leisler's bat	1	Commuting	Heard not seen
21:09	Soprano pipistrelle	1	Commuting	Heard not seen

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
21:13	Common pipistrelle	1	Foraging	Heard not seen
21:15	Leisler's bat	1	Foraging	Heard not seen
21:18	Common pipistrelle	1	Commuting	Heard not seen
21:22	Common pipistrelle	1	Commuting	Heard not seen
21:22 - 21:24	Soprano pipistrelle	1	Commuting and foraging	Heard not seen
21:25 - 21:27	Common pipistrelle	1	Commuting	Heard not seen
21:27	Soprano pipistrelle	2	Commuting	Heard not seen
21:31	Common pipistrelle	1	Commuting	Seen commuting along lane at 8-10m above head height
21:28 - 21:30	Common pipistrelle	1	Commuting and foraging	Heard not seen at laneway
21:32	Soprano pipistrelle	1	Commuting	Heard not seen at laneway
21:34 - 21:36	Soprano pipistrelle	1	Commuting	Heard not seen at laneway
21:36 - 21:37	Common pipistrelle	1	Commuting	Heard not seen at laneway
21:46	Soprano pipistrelle	1	Foraging	Heard not seen at laneway
21:47	Common pipistrelle	1	Commuting	Heard not seen at laneway

24/07/2015 – T62-T63

Time	Species	No. of bats	Activity	Notes
21:54	Leisler's bat	1	Commuting	Came from north of transect and circled field
21:56	Leisler's bat	1	Foraging	Circling field along transect route
21:59	Leisler's bat	1	Foraging	Circling field along transect route
22:00	Leisler's bat	2	Foraging	Circling field along transect route
22:02	Leisler's bat	2	Foraging	Circling field along transect route
22:04	Leisler's bat	2	Foraging	Circling field along transect route
22:05	Leisler's bat	3	Foraging	Circling field along transect route
22:07	Leisler's bat	3	foraging	Circling field
22:09	Leisler's bat	1	Foraging	Corner of field
22:11	Leisler's bat	1	Commuting	Heard not seen
22:16	Soprano pipistrelle	1	Commuting	Heard not seen
22:18	Soprano pipistrelle	1	Commuting	Flying over the field
22:18	Common pipistrelle	1	Commuting	Flying over the field
22:20	Common pipistrelle	1	Foraging	Flying around tree line at field

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
22:24	Common pipistrelle	3	Foraging	Flying along hedge line
22:27	Soprano pipistrelle	1	Foraging	Along tree line
22:30	Leisler's bat	1	Commuting	Heard not seen
22:30	Soprano pipistrelle	1	Commuting	Heard not seen
22:37	Leisler's bat	1	Commuting	Heard not seen
22:40	Soprano pipistrelle	1	Commuting	Heard not seen
22:42	Common pipistrelle	1	Commuting	Heard not seen
22:44	Common pipistrelle	1	Commuting	Heard not seen
22:45	Common pipistrelle	1	Commuting	Heard not seen
22:46	Common pipistrelle	1	Commuting	Heard not seen
22:48	Soprano pipistrelle	1	Commuting and Foraging	Heard not seen
22:55 - 22:56	Common pipistrelle	1	Commuting and Foraging	Heard not seen
23:06	Common pipistrelle	1	Commuting	Listening stop at north western part of site.
23:17	Common pipistrelle	1	Foraging	Heard at a shed but not seen
23:22	Common pipistrelle	1	Commuting	Heard not seen
23:23	Common pipistrelle	2	Commuting and foraging	Heard not seen
23:34	Common pipistrelle	1	Commuting	Heard not seen

14/09/2015 – T62-T63

Time	Species	No. of bats	Activity	Notes
20:20	Common pipistrelle	1	Commuting	Seen flying at listening stops
20:56	Bat of the *Pipistrellus* genus	1	Commuting	Heard not recorded
21:06	Brown long eared bat	1	Commuting	Heard not recorded
21:13	Common pipistrelle	1	Commuting	Heard not recorded
21:19	Soprano pipistrelle	1	Commuting	Heard not recorded
21:21	Unidentified bat	1	social call	Heard not recorded
21:38	Soprano pipistrelle	1	commuting and social call	Heard not recorded
21:40	Leisler's bat	1	Commuting	Heard not recorded
21:42	Soprano pipistrelle	1	Commuting	Heard not recorded
21:43	Bat of the *Pipistrellus* genus	1	Commuting	Heard not recorded
21:44	Common pipistrelle	1	Commuting	Heard not recorded
21:47	Common pipistrelle	1	Commuting	Heard not recorded

24/07/2015 – T64

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
21:51	Leisler's bat	2	Commuting and foraging	Seen flying to the west of tower 64
21:50	Leisler's bat	1	Commuting and foraging	Seen flying to the west of tower 64
21:52	Leisler's bat	1	Foraging	Seen flying to the west of tower 64
21:53	Leisler's bat	1	Commuting and foraging	Seen flying to the west of tower 64
21:56	Leisler's bat	1	Foraging	Seen flying over a field to the north west of tower 64
21:56	Leisler's bat	1	Commuting	Seen flying over a field to the north west of tower 64
21:56	Leisler's bat	1	Commuting	Seen flying over a field to the north west of tower 64
21:57	Leisler's bat	1	Commuting	Seen flying over a field to the north west of tower 64
21:58	Leisler's bat	1	Commuting and foraging	Seen flying over a field to the north west of tower 64
21:59	Leisler's bat	1	Commuting and foraging	Seen flying over a field to the north west of tower 64
22:00	Leisler's bat	1	Commuting	Seen flying over a field to the north west of tower 64
22:06	Leisler's bat	1	Commuting	Seen flying over a field to the north west of tower 65
22:07	Leisler's bat	1	Commuting	Seen flying over a field to the north west of tower 66
22:08	Leisler's bat	1	Commuting	Seen flying over a field to the north west of tower 67
22:18	Common pipistrelle	1	Commuting	Heard not seen
22:25	Common pipistrelle	1	Commuting	Heard from listening point in bottom-right corner of field with tower 64
22:29	Soprano pipistrelle	1	Commuting	Heard not seen
22:31	Common pipistrelle	1	Commuting	Heard at the west of tower 64
22:54	Soprano pipistrelle	2	Commuting	Heard at the west of tower 64
22:56	Common pipistrelle	1	Commuting	Heard at the west of tower 64
23:02	Common pipistrelle	1	Commuting	Heard to the south of tower 64
23:08	Common pipistrelle	1	Commuting and foraging	Heard to the south of tower 64
23:09	Common pipistrelle	1	Commuting and foraging	Heard to the south of tower 64
23:10	Common pipistrelle	1	Commuting and foraging	Heard to the south of tower 64
23:14	Common pipistrelle	1	Commuting	Heard not seen
23:23	Common pipistrelle	1	Commuting	Heard not seen
23:42	Common pipistrelle	1	Commuting	Heard not seen

Capabilities on project:
Environment

14/09/2015 – T64

Real time	Species	No. of bats	Activity	Notes
20:18	Common pipistrelle	1	Commuting	Heard not seen
20:22	Common pipistrelle	1	Commuting and foraging	Heard not seen
20:27	Soprano pipistrelle	1	Commuting	Heard not seen
20:28	Common pipistrelle	1	Commuting	Heard not seen
20:30	Common pipistrelle	1	Commuting	Heard not seen
20:33	Common pipistrelle	2	Commuting	Heard not seen
20:33	Soprano pipistrelle	1	Commuting	Heard not seen
20:37	Common pipistrelle	1	Commuting	Heard not seen
20:41 - 20:43	Soprano pipistrelle	1	Commuting	Heard not seen
20:43	Common pipistrelle	1	Commuting	Heard not seen
20:44	Soprano pipistrelle	1	Commuting	Heard not seen
20:46	Soprano pipistrelle	1	Commuting	Heard not seen
20:48	Common pipistrelle	1	Commuting	Heard not seen
20:49	Soprano pipistrelle	1	Foraging	Heard not seen
20:51	*Myotis* spp.	1	Commuting	Heard not seen
20:52	Soprano pipistrelle	1	Commuting	Heard not seen
20:54	Soprano pipistrelle	1	Commuting	Heard not seen
20:55	Common pipistrelle	1	Commuting	Heard not seen
20:56	Common pipistrelle	1	Commuting and foraging	Heard not seen
20:57	Soprano pipistrelle	1	Commuting	Heard not seen
20:57 - 20:58	Common pipistrelle	1	Commuting	Heard not seen
20:58	Soprano pipistrelle	1	Commuting	Heard not seen
21:00	Common pipistrelle	1	Commuting	Heard not seen
21:12 - 21:13	Common pipistrelle	1	Commuting and foraging	Heard not seen
21:11	Common pipistrelle	1	Commuting	Heard not seen
21:15	Leisler's bat	1	Commuting	Heard not seen
21:15	Soprano pipistrelle	1	Commuting	Heard not seen
21:15 - 21:18	Common pipistrelle	1	Commuting and foraging	Heard not seen
21:32	Common pipistrelle	1	Commuting	Heard not seen
21:38	Common pipistrelle	1	Commuting	Heard not seen
21:38 - 21:40	Common pipistrelle	1	Commuting	Heard not seen
21:42 - 21:44	Common pipistrelle	1	Commuting and foraging	Heard not seen

Real time	Species	No. of bats	Activity	Notes
21:44	Soprano pipistrelle	1	Commuting	Heard not seen
21:47	Soprano pipistrelle	1	Foraging	Heard not seen
21:52	Common pipistrelle	1	Commuting	Heard not seen

Emergence surveys

In July and September, there were a total of six emergence surveys completed. These were at the substation site and at T60. The emergence surveys completed at the substation site were completed on a tree line which had previously been identified as a bat roost and a shed. These structures were surveyed in July and September. A tree line to the west of tower 59 and 60 had an emergence survey completed on it is September. Two surveyors were placed on the eastern and western sides of the tree line. This was because one surveyor could not see through the trees to assess activity on the opposite side of the tree line.

30/07/2015 – Roost identified in shed on substation site

Time	Species	No. of bats	Activity	Notes
21:35	Leisler's bat	1	Commuting	Heard not seen
21:38	Leisler's bat	1	Commuting	Heard not seen
21:39	Leisler's bat	1	Commuting	To the west of the substation
22:02	Common pipistrelle	1	Emergence	Emerged from shed, flying very close to the shed roof, then back to the sycamore tree to the west of the shed.
22:05	Soprano pipistrelle	1	Commuting	Seen between tree and shed.
22:06	Soprano pipistrelle	1	Commuting	Flying west behind shed
22:10	Leisler's bat	1	Commuting	Heard not seen
22:10	Common pipistrelle	1	Foraging	seen flying from tree to the south east
22:17	Soprano pipistrelle	1	Commuting	Heard not seen
22:21	Leisler's bat	1	Commuting	Heard not seen
22:21	Common pipistrelle	1	Emergence	Emerged from shed.
22:22	Common pipistrelle	1	Commuting	Seen completing circuit of shed.
22:30	Common pipistrelle	1	Commuting	From the western side of the shed
22:32	Common pipistrelle	1	Commuting	Heard not seen
22:33	Common pipistrelle	1	Commuting	Heard not seen
22:35	Common pipistrelle	1	Commuting	Heard not seen
22:58	Bat of the *Pipistrellus* genus	1	Commuting	Heard not seen
23:07	Soprano pipistrelle	1	Foraging	Heard not seen
23:08	Soprano pipistrelle	1	Foraging	Heard not seen

30/07/2015 Tree line on substation site

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
21:54	Soprano pipistrelle	1	Commuting	Seen emerging from tree line
22:02	Leisler's bat	1	Commuting	Heard not seen
22:02	Leisler's bat	1	Commuting and foraging	Heard not seen
22:09	Soprano pipistrelle	1	Commuting	Heard not seen
22:11 - 22:16	Soprano pipistrelle	2	Foraging	Seen foraging in tree line
22:12 - 22:16	Leisler's bat	1	Commuting	Heard not seen
22:17 - 22:20	Soprano pipistrelle	3	Foraging	Seen foraging in tree line
22:20 - 22:22	Soprano pipistrelle	1	Commuting and foraging	Heard not seen
22:26 - 22:27	Soprano pipistrelle	1	Commuting	Heard not seen
22:30	Soprano pipistrelle	1	Commuting	Heard not seen
22:32	Common pipistrelle	1	Foraging	Heard not seen
22:38	Common pipistrelle	1	Commuting	Heard not seen
22:43	Leisler's bat	1	Commuting	Heard not seen
22:44	Soprano pipistrelle	1	Commuting	Heard not seen
22:48	Common pipistrelle	1	Commuting	Heard not seen
22:49 - 22:50	Soprano pipistrelle	1	Commuting	Heard not seen
22:53	Leisler's bat	1	Commuting	Heard not seen
23:01	Soprano pipistrelle	1	Commuting	Heard not seen
23:22	Soprano pipistrelle	1	Commuting	Heard not seen

23/09/2015 Shed on substation site

Time	Species	No. of bats	Activity	Notes
19:55	Leisler's bat	1	Commuting	Heard not seen
19:59	Leisler's bat	1	Commuting	Heard not seen
21:15	Leisler's bat	1	Commuting	Heard not seen
21:17	Leisler's bat	1	Commuting	Heard not seen
21:30	Soprano pipistrelle	1	Commuting	Seen commuting to the east of the shed

23/09/2015 Tree line on substation site

Real time	Species	No. of bats	Activity	Notes
19:42	Common pipistrelle	1	Commuting	Heard not seen but not recorded.

Real time	Species	No. of bats	Activity	Notes
19:54	Leisler's bat	1	Commuting	Heard not seen
20:20	Leisler's bat	1	Commuting	Heard not seen but not recorded.

24/09/2015 Tree line in vicinity of T59-T60 (western side)

Time	Species	No. of bats	Activity	Notes
19:49	Leisler's bat	1	Commuting	Heard not seen
19:59	Leisler's bat	1	Commuting	Heard not seen
20:05	Leisler's bat	1	Commuting	Heard not seen
20:08	Common pipistrelle	1	Commuting	Heard at treeline behind surveyor but not recorded
20:22	Common pipistrelle	1	Commuting	Heard not seen
21:14	Common pipistrelle	1	Commuting	Heard in hedge line adjacent to T60 but not recorded.

24/09/2015 Tree line in vicinity of T59-T60 (eastern side)

Time	Species	No. of bats	Activity	Notes
19:49	Leisler's bat	1	Commuting	Heard not seen
19:58	Bat of the *Pipistrellus* genus	1	Commuting	Seen flying around a stumpy tree in the corner of the site
19:59	Leisler's bat	1	Commuting	Heard not seen
20:07	Bat of the *Pipistrellus* genus	1	Commuting	Heard not seen
20:59	Leisler's bat	1	Commuting	Heard not seen
21:12	Leisler's bat	1	Commuting	Heard not seen
20:23	Common pipistrelle	1	Commuting	Heard not seen
21:42	Common pipistrelle	1	Commuting	Heard not seen
22:04	Bat of the *Pipistrellus* genus	1	Commuting	Heard not seen adjacent to the boundary
22:06	Bat of the *Pipistrellus* genus	1	Commuting	Heard not seen adjacent to the boundary
22:07	Common pipistrelle	1	Commuting	Heard not seen adjacent to the boundary
22:22	unidentified bat	1	Commuting	Heard not seen adjacent to the boundary

Re-entry surveys

31/07/2015 – Roost identified in tin roofed shed on substation site

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
03:34	Soprano pipistrelle	1	Commuting	Heard not seen
03:35	Soprano pipistrelle	1	Commuting	Heard not seen
04:03	Leisler's bat	1	Commuting	Heard not seen
04:04	Leisler's bat	1	Commuting	Heard not seen
04:19	Soprano pipistrelle	1	Commuting	Heard not seen
04:39	Soprano pipistrelle	1	Commuting	Heard not seen
04:45	Unidentified bat	1	Re-entry	Non echolocating bat flew into sycamore tree behind tin roofed shed.
04:51	Leisler's bat	1	Commuting	Heard not seen
04:52:00	Leisler's bat	1	Foraging	Heard not seen
04:53	Leisler's bat	1	Foraging	Heard not seen
04:55	Leisler's bat	1	Foraging	Heard not seen
05:04	Leisler's bat	1	Foraging	Heard not seen but foraged until 5:10

31/07/2015 Tree line on substation site

Real time	Species	No. of bats	Activity	Notes
03:53	Soprano pipistrelle	1	Commuting	Heard around trees
03:58	Bat of the *Myotis* genus	1	Commuting	Heard around trees
04:00	Unidentified bat	1	Commuting	Heard around trees
04:11	Soprano pipistrelle	2	Commuting	Flying east
04:13	Nathusius' pipistrelle	1	Commuting	Heard not seen
04:15	Leisler's bat	1	Commuting	Heard not seen
04:24	Common pipistrelle	1	Commuting	Heard not seen
04:28	Unidentified bat	1	Commuting	Heard not seen
04:29	Common pipistrelle	1	Commuting	Heard not seen
04:29	Bat of the *Myotis* genus	1	Commuting	Heard not seen
04:29	Soprano pipistrelle	1	Commuting	Heard not seen
04:30	Bat of the *Myotis* genus	1	Commuting	Heard not seen
04:30	Soprano pipistrelle	1	Commuting	Heard not seen
04:37	Common pipistrelle	2	Commuting	Heard not seen
04:38	Soprano pipistrelle	2	Commuting	Seen around tree line
04:39	Common pipistrelle	2	Commuting	Heard not seen
04:40	Soprano pipistrelle	1	Commuting	Heard not seen
04:41	Soprano pipistrelle	1	Commuting	Heard not seen
04:41	Common pipistrelle	1	Commuting	Heard not seen
04:47	Leisler's bat	1	Commuting	Heard not seen

Capabilities on project:
Environment

Real time	Species	No. of bats	Activity	Notes
04:50	Soprano pipistrelle	1	Re-entry	Flying into tree beside current roost location
04:52	Common pipistrelle	1	Commuting	Flying east
04:52	Leisler's bat	1	Commuting	Flying east
04:53	Soprano pipistrelle	1	Foraging	Flying east
04:55	Soprano pipistrelle	2	Commuting	Flying east
04:56	Bat of the *Myotis* genus	1	Commuting	Heard not seen
04:56 - 04:58	Leisler's bat	1	Commuting	Heard not seen
05:01- 05:02	Leisler's bat	1	Commuting	Heard not seen

24/09/2015 Tin roofed shed on substation site

Real time	Species	No. of bats	Activity	Notes
04:49	Soprano pipistrelle	2	Commuting	Heard not seen
05:34	Soprano pipistrelle	2	Commuting	Heard not seen
05:35	Common pipistrelle	1	Commuting	Heard not seen
05:36	Nathusius' pipistrelle	1	Commuting	Heard not seen
05:36	Common pipistrelle	1	Commuting	Heard not seen
05:38	Soprano pipistrelle	2	Commuting	Heard not seen
05:53	Soprano pipistrelle	2	Commuting	Heard not seen
06:09	Bat of the *Myotis* genus	1	Commuting	Heard not seen
06:13	Soprano pipistrelle	1	Commuting and Social calls	Heard not seen

24/09/2015 Tree line on substation site

Date	Species	No. of bats	Activity	Notes
05:17	Unidentified bat	1	Social call	Just social call heard
05:24	Leisler's bat	1	Commuting	Heard not seen
05:32	Leisler's bat	1	Commuting	Heard not seen
05:33	Unidentified bat	1	Social call	Heard not seen
05:39	Soprano pipistrelle	1	Commuting	Heard not seen
05:40	Soprano pipistrelle	1	Commuting	Heard not seen

25/09/2015 Tree line in vicinity of T59-T60 (western side)

Time	Species	No. of bats	Activity	Notes
06:15	Common pipistrelle	1	Commuting	Heard not seen

Capabilities on project:
Environment

Time	Species	No. of bats	Activity	Notes
06:39	Unidentified bat	1	Social calls	Flying towards T59 along treeline.

25/09/2015 Tree line in vicinity of T59-T60 (eastern side)

The surveyor did not record any activity on the eastern side of the tree line.

Appendix D – 2013 Data

Capabilities on project:
Environment
Results of 2013 Dusk Transect Surveys

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
21/05/2013	**Dusk**	T1-T2	0	1	0	0	1	0	0	2
21/05/2013	**Dusk**	T3, T4, T5	3	2	0	0	2	0	0	7
21/05/2013	**Dusk**	T6, T7, T8	0	2	0	0	0	0	0	2
22/05/2013	**Dusk**	T10, T11,T12	0	0	0	0	1	0	0	1
22/05/2013	**Dusk**	T13, T14	0	0	0	0	0	0	0	0
22/05/2013	**Dusk**	T15, T16	0	3	0	0	0	0	0	3
23/05/2013	**Dusk**	T41, T42, T43	1	5	0	0	0	0	0	6
23/05/2013	**Dusk**	T44	0	4	0	0	0	0	0	4
28/05/2013	**Dusk**	T49, T50, T51, T52, T53	1	4	0	0	0	0	0	5
29/05/2013	**Dusk**	T12	0	2	0	0	0	0	0	2
29/05/2013	**Dusk**	T29 T30	5	8	0	4	2	15	0	34
30/05/2013	**Dusk**	T61 Access Road Area	2	0	0	0	2	0	0	4
30/05/2013	**Dusk**	T59		9	0	0	0	0	0	9
05/06/2013	**Dusk**	T7 T6 T5 T4	0	0	0	0	0	0	0	0
05/06/2013	**Dusk**	T1 T2 T3 T4	6	2	0	0	5	1	0	14
05/06/2013	**Dusk**	T1 T2 T3 T4	5	1	0	0	0	0	3	9
24/06/2013	**Dusk**	T8 T9 T10 T11	7	5	0	8	6	0	0	26

Capabilities on project:
Environment

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
24/06/2013	**Dusk**	T12 Access lane T13 T14 T15 T16	1	0	0	2	0	0	17	20
24/06/2013	**Dusk**	T20 T21 T23 (N.B. T22 hedgelines northwest and southwest surveyed from accessible land	1	2	0	1	0	0	0	4
24/06/2013	**Dusk**	T26 T27 T28 T29	5	9	0	6		0	0	20
25/06/2013	**Dusk**	T41 T42 T43	12	7	0	4	3	0	0	26
25/06/2013	**Dusk**	T43 T44 T45	14	6	0	6	0	0	0	26
25/06/2013	**Dusk**	T47 T48 T49	5	20	0	0	2	0	0	27
25/06/2013	**Dusk**	T49 T50 T51 T52, T53	9	5	0	12	8	0	1	35
25/06/2013	**Dusk**	T62 T63	5	1		21	7	0		34
26/06/2013	**Dusk**	T59 T60, T61 including T61 access road	13	0	0	21	0	0	0	34
26/06/2013	**Dusk**	T64 T65 T67	8	2	0	5	3	0	5	23

Capabilities on project:
Environment

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
26/06/2013	**Dusk**	T77 T78 T79	4	2	0	1	1	0	0	8
27/06/2013	**Dusk**	T23 T24 T25 and east of T30	17	4	0	0	7	0	0	28
27/06/2013	**Dusk**	T28, T29, T30,	8	26	1	7	12	1	0	55
27/06/2013	**Dusk**	T80, T81, T82, T83, 40M NW of T84	8	7	0	17	3	0	0	35
27/06/2013	**Dusk**	T87 and access	1	0	0	2	0	0	0	3
27/06/2013	**Dusk**	T97,and accessible land north and west of T98	2	1	0	1	1	0	0	5
15/07/2013	**Dusk**	T60, T61, and T64	11		0	6	0	0	0	17
15/07/2013	**Dusk**	T62 , and access road	5	0	13	12	0	0	0	30
16/07/2013	**Dusk**	T79, T80	1	1	0	0	0	0	1	3
16/07/2013	**Dusk**	T65, T67 and T78	5	0	0	2	2	0	7	16
16/07/2013	**Dusk**	T74, T75	1	0	11		1	0	0	13
22/07/2013	**Dusk**	T99, T100, and transect on accessible land north of T101	17	0	4	2	3	0	0	26
22/07/2013	**Dusk**	T97	18	0	0	4	8	0	0	30

Capabilities on project:
Environment

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
22/07/2013	**Dusk**	T87 and T87 access route	5	2	1	4	0	0	0	12
22/07/2013	**Dusk**	T81, T82, T83,	2	0	2	0	0	0	4	8
25/07/2013	**Dusk**	T33, (accessible area and access route) T45, T47,T55	2	2	0	1	3	0	0	8
25/07/2013	**Dusk**	T34, T47	6	8	0	2	0	0	0	16
25/07/2013	**Dusk**	T25	0	0	0	0	0	0	0	0
25/07/2013	**Dusk**	Static survey by field gate south of T55	3	0	0	0	0	0	0	3
30/07/2013	**Dusk**	T91, T92 and border	0	0	0	0	0	0	15	15
TOTAL			**219**	**153**	**32**	**151**	**83**	**17**	**53**	708

Capabilities on project:
Environment
Bat Activity Index (BAI) per hour

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
21/05/2013	**Dusk**	T1-T2	0.00	0.54	0.00	0.00	0.54	0.00	0.00	1.08
21/05/2013	**Dusk**	T3, T4, T5	1.62	1.08	0.00	0.00	1.08	0.00	0.00	3.78
21/05/2013	**Dusk**	T6, T7, T8	0.00	1.08	0.00	0.00	0.00	0.00	0.00	1.08
22/05/2013	**Dusk**	T10, T11,T12	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.50
22/05/2013	**Dusk**	T13, T14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22/05/2013	**Dusk**	T15, T16	0.00	1.50	0.00	0.00	0.00	0.00	0.00	1.50
23/05/2013	**Dusk**	T41, T42, T43	0.53	2.63	0.00	0.00	0.00	0.00	0.00	3.16
23/05/2013	**Dusk**	T44	0.00	2.11	0.00	0.00	0.00	0.00	0.00	2.11
28/05/2013	**Dusk**	T49, T50, T51, T52, T53	0.57	2.29	0.00	0.00	0.00	0.00	0.00	2.86
29/05/2013	**Dusk**	T12	0.00	1.14	0.00	0.00	0.00	0.00	0.00	1.14
29/05/2013	**Dusk**	T29 T30	2.86	4.57	0.00	2.29	1.14	8.57	0.00	19.43
30/05/2013	**Dusk**	T61 Access Road Area	1.18	0.00	0.00	0.00	1.18	0.00	0.00	2.35
30/05/2013	**Dusk**	T59	0.00	5.29	0.00	0.00	0.00	0.00	0.00	5.29
05/06/2013	**Dusk**	T7 T6 T5 T4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
05/06/2013	**Dusk**	T1 T2 T3 T4	2.35	0.78	0.00	0.00	1.96	0.39	0.00	5.49
05/06/2013	**Dusk**	T1 T2 T3 T4	1.96	0.39	0.00	0.00	0.00	0.00	1.18	3.53
24/06/2013	**Dusk**	T8 T9 T10 T11	2.80	2.00	0.00	3.20	2.40	0.00	0.00	10.40

Capabilities on project:
Environment

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
24/06/2013	**Dusk**	T12 Access lane T13 T14 T15 T16	0.40	0.00	0.00	0.80	0.00	0.00	6.80	8.00
24/06/2013	**Dusk**	T20 T21 T23 (N.B. T22 hedgelines northwest and southwest surveyed from accessible land	0.40	0.80	0.00	0.40	0.00	0.00	0.00	1.60
24/06/2013	**Dusk**	T26 T27 T28 T29	2.00	3.60	0.00	2.40	0.00	0.00	0.00	8.00
25/06/2013	**Dusk**	T41 T42 T43	4.80	2.80	0.00	1.60	1.20	0.00	0.00	10.40
25/06/2013	**Dusk**	T43 T44 T45	5.60	2.40	0.00	2.40	0.00	0.00	0.00	10.40
25/06/2013	**Dusk**	T47 T48 T49	2.00	8.00	0.00	0.00	0.80	0.00	0.00	10.80
25/06/2013	**Dusk**	T49 T50 T51 T52, T53	3.60	2.00	0.00	4.80	3.20	0.00	0.40	14.00
25/06/2013	**Dusk**	T62 T63	2.00	0.40	0.00	8.40	2.80	0.00	0.00	13.60
26/06/2013	**Dusk**	T59 T60, T61 including T61 access road	5.10	0.00	0.00	8.24	0.00	0.00	0.00	13.33
26/06/2013	**Dusk**	T64 T65 T67	3.14	0.78	0.00	1.96	1.18	0.00	1.96	9.02

Capabilities on project:
Environment

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
26/06/2013	**Dusk**	T77 T78 T79	1.57	0.78	0.00	0.39	0.39	0.00	0.00	3.14
27/06/2013	**Dusk**	T23 T24 T25 and east of T30	6.80	1.60	0.00	0.00	2.80	0.00	0.00	11.20
27/06/2013	**Dusk**	T28, T29, T30,	3.20	10.40	0.40	2.80	4.80	0.40	0.00	22.00
27/06/2013	**Dusk**	T80, T81, T82, T83, 40M NW of T84	3.20	2.80	0.00	6.80	1.20	0.00	0.00	14.00
27/06/2013	**Dusk**	T87 and access	0.40	0.00	0.00	0.80	0.00	0.00	0.00	1.20
27/06/2013	**Dusk**	T97,and accessible land north and west of T98	0.80	0.40	0.00	0.40	0.40	0.00	0.00	2.00
15/07/2013	**Dusk**	T60, T61, and T64	4.23	0.00	0.00	2.31	0.00	0.00	0.00	6.54
15/07/2013	**Dusk**	T62 , and access road	1.92	0.00	5.00	4.62	0.00	0.00	0.00	11.54
16/07/2013	**Dusk**	T79, T80	0.38	0.38	0.00	0.00	0.00	0.00	0.38	1.15
16/07/2013	**Dusk**	T65, T67 and T78	1.92	0.00	0.00	0.77	0.77	0.00	2.69	6.15
16/07/2013	**Dusk**	T74, T75	0.38	0.00	4.23	0.00	0.38	0.00	0.00	5.00
22/07/2013	**Dusk**	T99, T100, and transect on accessible land north of T101	6.80	0.00	1.60	0.80	1.20	0.00	0.00	10.40
22/07/2013	**Dusk**	T97	7.20	0.00	0.00	1.60	3.20	0.00	0.00	12.00

Capabilities on project:
Environment

Date	Survey	Proposed Tower Transects	Common Pipistrelle	Leisler's Bat	*Myotis* spp	*Pipistrellus* spp	Soprano Pipistrelle	Nathusius'	Unidentified Bat	Survey Total
22/07/2013	**Dusk**	T87 and T87 access route	2.00	0.80	0.40	1.60	0.00	0.00	0.00	4.80
22/07/2013	**Dusk**	T81, T82, T83,	0.80	0.00	0.80	0.00	0.00	0.00	1.60	3.20
25/07/2013	**Dusk**	T33, (accessible area and access route) T45, T47,T55	0.73	0.73	0.00	0.36	1.09	0.00	0.00	2.91
25/07/2013	**Dusk**	T34, T47	2.18	2.91	0.00	0.73	0.00	0.00	0.00	5.82
25/07/2013	**Dusk**	T25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25/07/2013	**Dusk**	Static survey by field gate south of T55	1.09	0.00	0.00	0.00	0.00	0.00	0.00	1.09
30/07/2013	**Dusk**	T91, T92 and border	0.00	0.00	0.00	0.00	0.00	0.00	7.50	7.50