

Table of Contents

8	Ecology	1
8.1	Executive Summary	1
8.2	About the Authors	2
8.3	Policy and Guidance Informing Assessment	3
8.4	Summary of Documents.....	4
8.5	Further Environmental Information for the Purposes of the Inquiry.....	5
8.6	Scope of Assessment	6
8.7	Consultation Responses	8
8.8	Methodology and Surveys.....	8
8.9	Assessment Overview.....	9
8.10	Baseline Conditions	11
8.11	Assessment of Impacts Without Proposed Mitigation.....	12
8.12	Proposed Mitigation	14
8.13	Residual Impacts With Proposed Mitigation	16
8.14	Cumulative Impacts.....	17
8.15	Transboundary Impacts	18
8.16	Information to Inform Habitats Regulations Assessment.....	19
8.17	Response to Third Party and Statutory Consultee Submissions	19
8.18	Events since the Addendum	20
8.19	Summary and Conclusions	21

Appendix 1 - 2015 Interconnector Bat Report

Appendix 2 - Trewmount Road Bats Issue

8 Ecology

8.1 Executive Summary

1. Surveys were carried out for habitats, birds, mammals and other ecological receptors between 2004 and 2016.
2. Initial extensive surveys were carried out between 2004 and 2008, with additional surveys carried out in 2009, 2010, 2011, 2012 and 2013. Details of the surveys carried out are set out in Chapter 10 of the Consolidated ES (Section 10.2) and Chapter 8 of the Consolidated ES Addendum (Section 8.2). Additional surveys conducted in 2015 and 2016, since the publication of the Consolidated ES Addendum are appended at Appendix 1 and Appendix 2 of this Technical Report. All surveys have been conducted with due regard to relevant guidelines at the time of survey inception or agreed with the Northern Ireland Environment Agency (NIEA).
3. The provision of the proposed substation, towers, access routes and the overhead line will have a minimal impact on the ecology of the line route. The habitats present within the survey area are generally ecologically impoverished and of low value both intrinsically and as supporting habitats for protected fauna.
4. The study area is dominated by intensive agriculture. The species and habitats present reflect this with poor semi-improved and improved grassland enclosed by species poor heavily managed hedgerows. Habitats of greater value to biodiversity within the study area have been avoided as far as possible by a route design informed by ecological survey.
5. Mitigation measures are designed to firstly avoid and then minimise impacts on ecological receptors, such as habitats and species of ecological importance or conservation concern through the implementation of good working practices and awareness of the potential impacts of the works on ecological receptors. Where there is the potential for impacts on these receptors, the impacts will be reduced through the adoption of appropriate timing of activities, pre-construction (confirmatory) survey of features such as badger setts and bat roosts, through limiting the extent of actions that

will adversely affect habitats of ecological value, and through implementation of other mitigation that will prevent ecological damage for example in the water environment, and reinstatement of vegetation removed to facilitate construction. Additionally, habitat creation at the substation site will increase the extent of habitats of conservation value, potentially increasing the area suitable for nesting birds.

6. Habitat losses will be restricted to areas of low ecological value except for five locations where species rich hedgerows are present and an area of woodland requires trimming to accommodate the oversail, otherwise there will be limited adverse impact on ecological receptors (including flora and fauna).
7. As stated in the Statement of Case, the proposal avoids all designated areas and impacts upon protected species and habitats have been addressed through the provision of mitigation measures. The impact upon protected species (e.g. badgers) and habitats needs to be balanced against the benefit and need for the proposal.
8. A Habitats Regulation Assessment concluded that there would be no likely significant effects on European designated sites.
9. It is also relevant that NIEA Natural Heritage (consultation reply dated 20 August 2015) *"has considered the impacts of the proposal on designated sites and other Natural Heritage interests and based on the information provided and the HRA is content with the proposal with conditions"*.
10. In summary, extensive ecological assessment which shows that with mitigation the long term effects on habitats, species and biodiversity will be negligible. The proposed Tyrone - Cavan Interconnector will have a minimal effect on ecology with no likely significant effects. The Statement of Case explains that the need for the proposal demonstrably outweighs the minimal impact on ecology.

8.2 About the Authors

11. The ecology assessment of the proposed Tyrone - Cavan Interconnector was carried out by a team of AECOM specialists in ecological survey. Representing the AECOM team are Dr. Eleanor Ballard and Dr. Paul Lynas.

12. Dr. Lynas is an ecologist specialising in ornithology. He currently has over 15 years' post-graduate experience and is a Chartered Environmentalist (CEnv); Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and at present Dr. Lynas serves as Convenor of the Irish Section of CIEEM.
13. Dr. Lynas has particular wide-ranging experience in the assessment of linear infrastructure. During the last eight years, he has been involved at various DMRB stages of many large-scale strategic road developments across Northern Ireland. Prior to his consultancy work, Dr. Lynas worked as a Species Conservation Officer at the RSPB in Belfast. During his time there he was the lead author on the 'Birds of Conservation Concern in Ireland', the traffic light assessment tool for bird species across the country.
14. Dr. Ballard is a Chartered Environmentalist and a full member of CIEEM. Dr. Ballard has over 20 years' postgraduate experience in the environmental field. Dr. Ballard has a first class honours degree in Environmental Science and Doctorate in Plant Ecology, both from Ulster University. Her doctoral thesis was in the field of species rich grassland management. More recently, Dr. Ballard has read for a postgraduate diploma in Geographical Information Systems, the research element of which, concentrated on spatial distribution of smooth newt in Northern Ireland.
15. The ecological impact assessment for the Consolidated ES and its Addendum was written with support from Mr Tim Goodwin. Mr Goodwin is one of the leading ecologists in planning and is well known to members of the planning bar, planning solicitors and planning consultants. He provides expert evidence at inquiry, and in the courts, representing a range of blue chip companies on high profile projects.

8.3 Policy and Guidance Informing Assessment

8.3.1 Legislative and Policy Context

16. This is a summary of the information contained in the Consolidated ES, Chapter 10 – Ecology (pages 283 – 289) and the Statement of Case that has been prepared for the proposed Tyrone – Cavan Interconnector.

8.4 Summary of Documents

17. This technical report summarises and incorporates by reference the content of the documents submitted in support of the proposed Tyrone - Cavan Interconnector in respect of Ecology. These documents are as follows:

- Chapter 10 of the Consolidated ES (pages 280-370);
- Figures supporting Chapter 10 of the Consolidated ES, contained in Volume 4:
 - Figures 10.1 – 10.4 Extent of Surveys;
 - Figures 10.5 – 10.14 Phase 1 Habitat Mapping;
 - Figures 10.15 – 10.29 Breeding Bird Survey 2011;
 - Figures 10.30 – 10.48 Breeding Bird Survey 2012;
 - Figure 10.49 – Wintering Swans;
 - Figures 10.50 – 10.60 Otter Survey Locations;
 - Figures 10.61 – 10.75 Badgers Surveys (Confidential);
 - Figures 10.76 – 10.89 Bats Surveys; and
 - Figures 10.90 – 10.110 Ecology Summary Maps.
- Appendices supporting Chapter 10 of the Consolidated ES, contained in Volume 3:
 - Volume 3 Appendices Appendix 9A Details of ASSI Designations;
 - Volume 3 Appendices Appendix 10A Ecological Consultations;
 - Volume 3 Appendices Appendix 10B Bat Appendices;
 - Volume 3 Appendices Appendix 10C Phase 1 Habitat Survey Target Notes;
 - Volume 3 Appendices Appendix 10D Plant Species List;
 - Volume 3 Appendices Appendix 10E Badger Appendix;
 - Volume 3 Appendices Appendix 10F Breeding Birds;
 - Volume 3 Appendices Appendix 10G Wintering Birds; and
 - Volume 3 Appendices Appendix 10I Conservation Status.

- Chapter 8 of the Consolidated ES Addendum (Pages 97-100);
 - Appendices supporting Chapter 8 of the Consolidated ES Addendum, contained in Volume 3;
 - Appendix 2.1 Joint Environmental Report;
 - Appendix 8.1 Information to Inform Habitats Regulations Assessment;
 - Appendix 8.2 Smooth Newt Survey;
 - Appendix 8.3 Bat Survey Report (2013) and,
 - Appendix 9.1 Outline Construction Environmental Management Plan.
18. This technical report must therefore be read in conjunction with the Consolidated Environmental Statement (ES) and its Addendum, and not as a standalone document.
19. In a general sense, all EIA documentation is interrelated and, particularly with respect to the interaction of impacts, all the EIA documents are relevant. For clarity the documents that the authors consider to be the key documents are summarised above. The reader should form his or her own view on what documents within the Consolidated ES and its Addendum are relevant, and key, to the topic under consideration.
20. In the interest of readability these documents are not reproduced in full in this technical report and merely a summary presented.
- ## 8.5 Further Environmental Information for the Purposes of the Inquiry
21. Since the publication of the Consolidated ES and its Addendum, the following environmental information has become available, and is presented to the inquiry for the purposes of the inquiry. Accordingly, and by virtue of Regulation 23(6) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015 the requirements of paragraphs (4) and (5) of the said Regulation 23 do not apply.
22. Since the publication of the Consolidated ES Addendum, additional surveys have been completed. These assessments include:
- Supplementary bat survey was completed in July and September 2015. This report has been included as Appendix 1 to this technical report and its contents summarised in the relevant sections below; and

- Emergence and re-entry surveys of 152 Trew Mount Road were completed in August and September 2016. This report has been included as Appendix 2 to this technical report and its contents summarised in the relevant sections below.

23. These confirmatory surveys for bats have been completed since the publication of the Consolidated ES Addendum and are presented in this Technical Report. As bats are not a citation feature of any Natura 2000 or Ramsar sites within 30 km¹ of the proposed Tyrone – Cavan Interconnector, there is no change to the Appropriate Assessment for the proposed Tyrone – Cavan Interconnector that was undertaken by the Competent Authority (NIEA).
24. Likewise, confirmatory aerial surveys of the entire proposed Tyrone – Cavan Interconnector (proposed substation area and 500m either side of the overhead line centreline, which includes the proposed access tracks) were undertaken in October 2016. This photography was reviewed in terms of the ecological baseline conditions and nothing of note was detected.

8.6 Scope of Assessment

25. The Scope of the Assessment is presented in Section 10.2.2 of the Consolidated ES. The scope includes consultation, desktop study, field survey and impact assessment. Initial desktop study areas and field survey effort was determined by the nature of the potential receptor as summarised below, and refined over iterations of the design and the assessment:

- Desk study:
 - A radius of 30km was used for internationally designated sites (SPA, SAC and Ramsar sites);
 - A radius of 5km for ASSI designated for habitat features;
 - A radius of 10km for ASSI designated for bird features;
 - The qualifying features of all ASSI within 30km were reviewed but not assessed in full detail due to the static nature of the site and proximity of the proposed Tyrone – Cavan Interconnector;

¹ Identified potential zone of influence for bats, as shown in the Consolidated ES and its Addendum.

- A radius of 5km for Sites of Local Nature Conservation Importance (SLNCI);
- A radius of 10km for all Important Bird Areas (IBA);
- A radius of 500m for all Ancient Woodland Inventory Sites (AWI); and
- A radius of 500m for Local Environmental Record Centre search of protected and Priority Species.
- Field Surveys
 - Phase 1 Habitat survey- within 250m of the proposed Tyrone - Cavan Interconnector;
 - Smooth newt surveys - within 200m of the proposed Tyrone - Cavan Interconnector;
 - Badger surveys - within 250m of the proposed Tyrone - Cavan Interconnector;
 - Otter surveys – all watercourses within 250m of the proposed Tyrone - Cavan Interconnector;
 - Bat surveys:
 - Driven transects -within 500m of the proposed Tyrone - Cavan Interconnector;
 - Walked transects -within 250m of the proposed Tyrone - Cavan Interconnector;
 - Habitat suitability assessment- within 250m of the proposed Tyrone - Cavan Interconnector;
 - Ground based tree surveys within 100m of the proposed Tyrone - Cavan Interconnector;
 - Breeding bird surveys – within 200m of the proposed Tyrone - Cavan Interconnector;
 - Barn owl surveys– all potential trees within the proposed Tyrone - Cavan Interconnector; and,

- Wintering bird surveys – 500m wide corridor following the proposed Tyrone - Cavan Interconnector. Traditional Whooper swan sites within 5km of the proposed Tyrone - Cavan Interconnector were further assessed.

8.7 Consultation Responses

26. The pre submission consultation for the assessment is presented in detail in the Consolidated ES Chapter 6 Scoping and Consultation (pages 151 - 156). Copies of all ecological consultation responses are included in Appendix 10A with the exception of the Raptor Study Group which is confidential as it provides breeding details for protected species and is included in confidential Appendix 10C1. Consultation responses were reviewed and more specific issues arising from responses were addressed. In particular, both the RSPB and IWSSG raised concerns over the potential for disruption to whooper swan flight lines through the construction of new overhead lines. The NIEA were consulted on the proposed methodologies prior to survey commencement.
27. The NIEA (now DAERA) as the main ecological Statutory Consultee have no concerns in relation to the proposed Tyrone - Cavan Interconnector that cannot be met with the implementation of standard conditions that are normal for a project of this size.

8.8 Methodology and Surveys

28. This is a summary of the information contained in the Consolidated ES, Chapter 10 – Ecology (pages 281 – 301) and Chapter 8 of the Consolidated ES Addendum (pages 97-99) and its Appendices (Appendices 8.1, 8.2 and 8.3).
29. Initial surveys were carried out for wintering and breeding birds, mammals (badger, otter and bats), newts and other ecological receptors between 2004 and 2013. Priority species and habitats as listed in the UK Biodiversity Action Plan and additional species specific to Northern Ireland (as publically listed) were assessed during other surveys.
30. Initial extensive surveys were carried out between 2004 and 2008, with additional surveys carried out in 2009, 2010, 2011, 2012 and 2013. Details of the surveys carried out are set out in Chapter 10 of the Consolidated ES (Section 10.2) and Chapter 8 of the Consolidated ES Addendum (Section 8.2). All surveys have been conducted with due regard to the relevant guidelines at the time of inception or agreed with the Northern

Ireland Environment Agency (NIEA). NIEA specifications are designed for discrete sites. Due to the linear nature of the proposed Tyrone - Cavan Interconnector amendments to standard specifications were agreed where necessary.

31. Of the site and adjacent 500m buffer, 97% was directly surveyed. This assessment area therefore included the tower locations, areas between towers and the access routes. The assessment of impacts covered 100% of all land parcels within the proposed Tyrone – Cavan Interconnector and adjacent lands.
32. Additional assessment in relation to the Habitats Regulations Assessment was conducted in 2015 and included as Appendix (8.1) to the Addendum.
33. Since publication of the Consolidated ES and its Addendum, site wide bat activity surveys and emergence re-entry surveys were conducted in 2015 and emergence re-entry surveys of 152 Trew Mount Road were carried out in 2016. These reports are presented as Appendices 1 and 2 of this Technical Report.

8.9 Assessment Overview

34. The provision of the proposed substation and the overhead line will have a minimal impact on the ecology of the line route. The habitats present within the survey area are generally ecologically impoverished and of low value both intrinsically and as supporting habitats for protected fauna.
35. The site is dominated by intensive agriculture and the species and habitats reflect this with semi improved and improved grassland and species poor, heavily managed hedgerows regularly occurring. Those areas of greater value to biodiversity have been avoided through design informed by many years of ecological survey, thereby protecting against impacts on those areas of greater value in the local area.
36. Mitigation measures have been designed to implement mitigation by avoidance of impacts on habitats and species of ecological value through scheme design, the implementation of good working practices and awareness of the potential impacts of the works on ecological receptors. Where there is the potential for limited impacts on ecological receptors, the impacts will be reduced through the adoption of appropriate timing of activities, pre-construction, confirmatory survey of features such as badger setts and bat roosts, and through limiting and mitigating the extent of actions that will

adversely affect habitats. Prescribed mitigation is as described in the outline Construction Environment Management Plan (Appendix 9.1 of the Consolidated ES Addendum). Measures to prevent ecological damage will include silt traps to protect the water environment and post construction reinstatement of vegetation removed, to facilitate construction. Additionally, habitat creation at the substation site will increase the extent of habitats of conservation value, by potentially increasing the area suitable for nesting birds.

37. Habitat losses will be restricted to areas of low conservation value, and there will be limited adverse impact on animal species. Most tower bases are located in areas of low ecological value, generally in improved grassland habitat, although it is acknowledged that occasionally the tower and its associated working area will require hedgerows to be trimmed, temporarily or permanently removed. Where tower bases and their associated working areas require the permanent removal of hedgerows, just 296 m of hedgerow will be permanently removed.
38. The Consolidated ES addendum, in particular Appendix 8.1 entitled "Information to inform Habitats Regulations Assessment", which supersedes the "Test of Likely Significance" presented in the Consolidated ES, satisfies the requirements of article 6(3) of the EC Habitats Directive, as transposed in Northern Ireland by the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended), to assess the proposed project for any likely significant effects on European sites, either alone or in combination with other plans or projects. As required by the Waddenzee case (Note 2: Decision of the ECJ in Waddenzee (C-127/02)), The assessment was conducted in light of the requirements of the precautionary principle and by using the best scientific knowledge in the field.
39. It is also relevant that NIEA Natural Heritage (consultation reply dated 20 August 2015) *"has considered the impacts of the proposal on designated sites and other Natural Heritage interests and based on the information provided and the HRA is content with the proposal with conditions"*.
40. The decommissioning of the proposed Tyrone – Cavan Interconnector is assessed in Chapter 1 of the Consolidated ES Addendum (page 5). The effects of decommissioning would be temporary and of a similar scale to or less than the construction phase, as

described and assessed in the Consolidated ES. Similar mitigation measures as described for the construction stage in the Consolidated ES should be again implemented to ensure the minimisation or elimination of any environmental impacts.

8.10 Baseline Conditions

41. This is a summary of the information contained in the Consolidated ES, Chapter 10 - Ecology (pages 281 - 301) and the Consolidated ES Addendum, Chapter 8 (pages 301-332). For clarity, a full list of relevant documents summarising the baseline conditions are presented in Section 8.4.
42. Further information on surveys conducted for smooth newt and bats is presented in Appendices of the Addendum and more recent surveys on bats (2015 and 2016) is presented as Appendices 1 and 2 of this Technical Report.
43. The habitats present within the survey area are generally ecologically impoverished and of low value both intrinsically and as supporting habitat for protected fauna.
44. The study area is dominated by intensive agriculture (85%) and the species and habitats present reflect this with poor semi improved and improved grassland and species poor heavily managed hedgerows dominating the study area.
45. There will be impacts to priority habitats (rare and protected habitats) in five locations along the proposed Tyrone – Cavan Interconnector. These include species-rich hedgerows which will be trimmed or cut in four locations, and an area of oak woodland which will be trimmed to accommodate the oversail.
46. Fauna baseline summary:
 - Badger are present in the area. Within 50m of a tower location two active setts were found; and a further five setts were located within 150m.
 - Otter are widespread in the Blackwater catchment, and this species occurs in the general area of the line corridor in south Armagh (NIEA 2001/2). However the nearest tower to the River Blackwater (Tower 32) is over 100m from the river bank.
 - Between 2004 and 2016, seven bat roosts, likely to be small transitory roosts of non-breeding bats, were identified. Of these roosts, four will be impacted in the

development of the substation. Common pipistrelle, soprano pipistrelle and Leisler's bats were widespread in the study area.

- Breeding birds of common species were present in hedgerows. A small number of bird species of conservation concern were present along the corridor. No potential nest sites for barn owl were found.
- Consultations with NIEA and IWSSG identified records of whooper swan using both the Blackwater Valley and a cluster of lakes near Keady. Surveys repeated over multiple years confirmed this.
- Surveys did not reveal any presence of newts in three areas of wetland, identified as having potential for smooth newt. CEDaR records obtained for the project did not include any records for smooth newt.
- Other species of relevance to the assessment, potentially in the area include the Irish hare and freshwater crayfish. However no suitable habitat for these species will be disturbed and no incidental records were recorded during survey.
- Common lizard and marsh fritillary butterfly were considered and scoped out of the assessment (and agreed by NIEA). In both cases it was considered that there would be no impacts due to the lack of suitable habitat within the study area; with intensively managed agricultural grassland making up 85% of field units in the study area. CEDaR records obtained for the project did not include any records for marsh fritillary.

8.11 Assessment of Impacts Without Proposed Mitigation

47. This is a summary of the information contained in the Consolidated ES, Chapter 10 - Ecology (pages 338 - 357) and the Consolidated ES Addendum, Chapter 8 (page 100).
48. The ecological assessment has found that the proposed Tyrone - Cavan Interconnector will have a minimal impact on the ecology of the land affected by the proposed overhead line route. No recognised sites of international, national or local conservation value will be adversely affected. The key impact will be the loss of the cumulative area of land required for tower bases and the substation, however, since the great majority of tower sites will be in fields devoted to agricultural (improved) grassland or in species-poor damp grassland of low conservation value, the ecological significance of this impact will be negligible. Siting of towers in or near hedgerows will result in some localised loss of short lengths of hedgerow, but there will be limited minor adverse impacts on the

ecological function of the hedgerows at each tower location, 296m of hedgerow will be permanently removed to facilitate the construction of the proposed Tyrone - Cavan Interconnector.

49. The loss of mature hedgerow trees, although at a small scale in relation to the length of the overhead line route and in terms of ecological function at a landscape scale, will reduce habitat diversity locally. It has been assessed that 125 trees will be permanently removed. Areas of conservation interest, such as species-rich grassland, rivers and wetlands have been avoided at tower location sites.
50. The provision of the proposed substation will require the removal of existing grassland and hedgerow habitats of low conservation value, together with a treeline which contains mature oaks, and the loss of potentially four bat roosts (including two roosts recorded in 152 Trew Mount Road). The earthworks required for the proposed substation provides opportunities for habitat creation that will increase the biodiversity interest of the site.
51. The proposed overhead line will have limited adverse impact on populations of protected species in the absence of mitigation for the following reasons:
 - Vegetation removal has been minimised by the small terrestrial foot print of the Tyrone – Cavan Interconnector and the selection of tower locations in improved grassland;
 - Only a small number of non breeding bat roosts are present in areas to be disturbed by the proposed Tyrone – Cavan Interconnector;
 - The location of the infrastructure for the Tyrone – Cavan Interconnector is away from potential habitat for otters;
 - Known badger setts in the study area are out with the recommended NIEA disturbance buffer of 25 m;
 - Newt habitat has been avoided;
 - Suitable habitats for breeding birds are available in the wider area and removal of hedgerows has been minimised by the design; and,
 - Wintering birds, at risk of impact by the overhead line are spatially restricted in the study area to the Blackwater Valley.

8.12 Proposed Mitigation

52. This is a summary of the information contained in the Consolidated ES, Chapter 10 - Ecology (page 358 - 366).
53. Where sections of hedgerows are to be lost through the construction of the tower bases, agreement will be sought with the landowner to establish a new hedge of similar length to that which will be lost. If the landowner does not wish to avail of this, the applicant will donate an amount to a conservation charity to be used for planting native trees of local provenance in County Armagh. Vegetation beneath the overhead line will require maintenance through trimming during the operation of the proposed Tyrone – Cavan Interconnector. The ecological connectivity provided by linear features within the planning application boundaries will be retained due to the minimal amount of hedgerows permanently lost.
54. In order to reduce noise and vibration impacts on badgers and otters, species appropriate protection zones, according to the species, type of works and nature of the receptor will be clearly marked out before any construction activities commence by the ecological clerk of works. No works of any kind including clearance of vegetation and storage of materials will take place within the protection zones, unless a licence has been issued by NIEA.
55. Clearance of plants, hedgerows and trees will take place outside the bird breeding season (i.e. 1 March to 31 August inclusive), unless assessed by a suitably experienced ecologist to ensure that no nesting birds are present.
56. A preconstruction verification bat survey will also be completed by the ecological clerk of works. This will be done on trees to be removed and checks will be extended to 150m around any towers where piling activities will take place during construction. Piling will increase the amount of vibration in the surrounding area, thus the presence of bats within this buffer will need to be checked. Should any tree with crevices suitable for use by bats be encountered these will be inspected under licence from NIEA using the most appropriate method specific to each tree (climbing / endoscope or emergence – re-entry).
57. As mitigation to wintering birds, bird flight deflectors will be fitted to the earth line between Towers 1 and 13 and Towers 30 and 43 at appropriate spacing.

58. The precise type of deflector will be agreed in advance with NIEA. As research in this field continues, the most up to-date information available on flight deflector effectiveness and design will be used. The flight deflector will be as large as possible and installed from tower to tower. The deflectors will be installed as close together as possible (at least every 5-10 m), and in contrasting colours e.g. black and white for maximum visibility in different weather and light conditions. The deflectors will also require monitoring and maintenance, and if necessary replacement. Monitoring will ensure that markers remain in position and functional throughout the lifetime of the overhead line.
59. A suitability qualified ecological clerk of works will be appointed for the construction phase. The ecological clerk of works will be well versed in the Construction Environmental Management Plan (CEMP), of which a detailed outline has been submitted as part of the proposed Tyrone – Cavan Interconnector (presented in Appendix 9.1 of the Consolidated ES Addendum). Strict adherence to the prescriptions within the final CEMP, agreed with NIEA prior to construction commencing, will ensure the protection of both terrestrial and aquatic ecological receptors. Amongst other duties, the ecological clerk of works will ensure that:
- Confirmatory surveys prior to construction are conducted;
 - Sensitive habitats are identified for the benefit of the contractors and site workers; explanation will be given on each specific habitat (i.e. fens) to describe the significance of the habitats and emphasise the need to avoid and therefore protect them;
 - Access routes to and from tower locations have been designed within the proposed Tyrone - Cavan Interconnector to minimise impacts; in particular, significant precautions will take place during the construction of towers adjacent to sensitive habitats or within protection zones for badger, otter or bats;
 - Areas for storage of materials have been designated to ensure that they are located remote from sensitive habitats and watercourses;
 - Any direct construction impact on trees or hedges will not be carried out during the breeding season (1 March to 31 August), unless hand searched by a suitably experienced ecologist, and that in most cases vegetation clearance will only involve pollarding, with the loss of hedgerow trees being kept to a minimum;

- Mature trees with the potential to be used by bats will be inspected prior to tree clearance along the line route taking place (under licence from NIEA if necessary i.e. if the inspection requires use of an endoscope rather than emergence re-entry surveys);
- Unnecessary impacts to other species (i.e. frog spawning locations); which may occur unexpectedly are avoided;
- Reinstatement works of temporarily removed vegetation after the erection of towers and stringing of the overhead lines is completed; and
- The 100 bat boxes and seven barn owl boxes that have been detailed in the mitigation measures are appropriately sited and secured.

60. All these measures will be contractually enforced to ensure that they are delivered by the Contractor.

8.13 Residual Impacts With Proposed Mitigation

61. This is a summary of the information contained in the Consolidated ES, Chapter 10 - Ecology (page 362 - 366).

8.13.1 Habitats

62. It is determined that the proposed Tyrone - Cavan Interconnector will have a neutral impact on all habitats, due to the fact that in the main sensitive habitats are avoided, temporary vegetation loss is reinstated and hedgerows and trees to be permanently lost are replaced elsewhere.

8.13.2 Bats

63. Seven small, transitory roosts of small numbers of bats will be potentially impacted by the proposed Tyrone – Cavan Interconnector. Linear connectivity within the scheme for commuting and foraging will be retained due to the small terrestrial footprint of the proposed Tyrone - Cavan Interconnector and the small lengths of hedgerows requiring permanent removal. With mitigation there will be a neutral impact on the local population of bats.

8.13.3 Badger and Otter

64. With mitigation, it is determined that the proposed Tyrone - Cavan Interconnector will have a neutral impact on the badger population. Tower bases have been carefully sited to avoid impacts on multiple sett locations. Due to the small footprint of the terrestrial elements of the proposed Tyrone – Cavan Interconnector and availability of suitable foraging area outside of the proposed Tyrone – Cavan Interconnector, the foraging ability of the local population will not be compromised.
65. Due to the location of tower siting away from watercourses, there will be a neutral impact on otter.

8.13.4 Breeding Birds

66. Replacement shrub, tree and hedgerow planting, and wetland creation at the substation will augment the local habitat for breeding birds. Seven barn owl boxes will be erected exceeding the current baseline opportunities for this species. With mitigation, it is determined that the proposed Tyrone - Cavan Interconnector will have a neutral impact on breeding birds.

8.13.5 Wintering Birds

67. The residual impacts on wintering birds will be neutral, due to the implementation of flight deflectors along sections of the overhead line.

8.13.6 Other Rare and Notable Species

68. Other rare and notable species potentially in the area include the Irish hare (one record within 5km) and freshwater crayfish. It has been determined that there would be no impact to these species. Tower bases will be constructed away from watercourses and the prescriptions within the outline CEMP will protect the hydrological environment avoiding any impacts of freshwater crayfish. Tower locations and other construction areas are located outwith any habitat suitable for Irish hare.

8.14 Cumulative Impacts

69. This is a summary of information that is contained Chapter 5 of the Consolidated ES Addendum (p57-59). A further assessment of cumulative effects is outlined in the Joint

Environmental Report for the proposed Interconnector project (i.e. the project in Northern Ireland and Ireland). This is contained in Volume 3 Appendix 2.1 of the Consolidated ES Addendum. In considering the effect of the proposed Tyrone - Cavan Interconnector in terms of ecology, and potential interactions and cumulative effects associated with other development proposals (as listed in Section 5.2.3 of Chapter 5) and any potential cumulative impacts), it is concluded that the potential cumulative ecology impacts are imperceptible.

8.15 Transboundary Impacts

70. This is a summary of information that is contained Chapter 6 of the Consolidated ES Addendum (pages 81-82). A further assessment of transboundary effects is outlined in the Joint Environmental Report for the proposed Interconnector project. This is contained in Volume 3 Appendix 2.1 of the Consolidated ES Addendum. It was assessed that there are no likely significant transboundary impacts in relation to ecology.
71. With regard to habitats, there will be no transboundary impacts as the proposed Tyrone - Cavan Interconnector has no direct land take within the Republic of Ireland and the potential for indirect effects through an increase in sediment load in watercourses or discharge of pollutants is minimised through the implementation of mitigation measures during construction as detailed in the Consolidated Environmental Statement (Appendix 9.1 Outline Construction Environmental Management Plan), which will avoid impacts to hydrological resources within and outwith the proposed Tyrone - Cavan Interconnector.
72. There will be no transboundary impacts on bats during the breeding or hibernation season in the Republic of Ireland as home range habitats will not be affected as a direct or indirect result of construction or operation of the proposed Tyrone - Cavan Interconnector. There is some potential for transboundary impacts upon migrating bats if construction work displaces any commonly used routes. Should this be the case the impact will be temporary and on a small spatial scale with displacement minimal. There will be no transboundary impacts on bats during operation and the potential for impacts during construction is considered negligible.
73. With regard to badger and otter, there will be no transboundary impacts as home ranges of either species in the Republic of Ireland will not be displaced or affected as a direct or

indirect result of construction or operation of the proposed Tyrone - Cavan Interconnector.

74. There will be no transboundary impacts on smooth newt as a result of the proposed Tyrone - Cavan Interconnector, because of the distance of appropriate breeding habitat from the proposed Tyrone - Cavan Interconnector.
75. There is a potential collision risk during the migration period for whooper swans that spend the majority of the winter period within the Republic of Ireland. The risks associated with collision have been assessed as negligible through extensive fieldwork and assessment of swan movements. This has been further minimised through the incorporated mitigation measure of adding bird flight deflectors to the earth wires in those areas deemed highest risk. Swans on migratory flights would in general be flying at a height that would not put them at risk of collision and the fleeting time that would be spent in the proximity of the proposed Tyrone - Cavan Interconnector during migration passage further reduces the risk.
76. There is no potential for transboundary impacts on breeding birds due to the relatively small breeding territory size of species recorded and a lack of displacement expected as part of the proposed Tyrone - Cavan Interconnector.

8.16 Information to Inform Habitats Regulations Assessment

77. The Information to Inform Habitats Regulations Assessment concluded that there would be no likely significant impacts on the conservation objectives or the selection features of any European Sites as a result of the proposed Tyrone - Cavan Interconnector. On 20 August 2015, the competent authority (NIEA) confirmed that it had carried out an Appropriate Assessment and concluded that subject to review of the final Construction Environment Management Plan (an outline copy was published for the project as Appendix 9.1 of the Consolidated ES Addendum) that there would be no adverse effect on the integrity of any Natura 2000 or Ramsar Sites.

8.17 Response to Third Party and Statutory Consultee Submissions

78. Between 2009 and 2012, there were approximately 6,000 third party submissions made in relation to the proposed Tyrone – Cavan Interconnector. These were reviewed and

taken into account in the writing of the Consolidated ES. Following the publication of that document in 2013, from May 2013 to May 2015, 2,957 third party submissions were made - of which 168 related to ecological issues. All submissions that were made have been taken into account in the writing of the Consolidated ES Addendum.

79. Between June 2015 and November 2016, there have been 594 third party submissions and of these 178 submissions made reference to ecological issues. The general issues raised by objectors relate to the loss of habitats and impacts to species (wildlife). The submissions did not raise any material considerations or any issues that were not dealt within the Consolidated ES and Addendum. The issues raised by the submissions are examined, analysed and evaluated in Chapter 10 of the Consolidated ES (Volume 2) and in Chapter 8 of Consolidated ES Addendum.
80. Since the publication in of the Consolidated ES Addendum, one statutory consultee has commented on ecological issues. NIEA Natural Heritage (consultation reply dated 20 August 2015) stated that it *"has considered the impacts of the proposal on designated sites and other Natural Heritage interests and based on the information provided and the HRA is content with the proposal with conditions"*.

8.18 Events since the Addendum

81. Since the publication of the Consolidated ES and its Addendum, the following environmental information has become available, and is presented in this document in order to inform the inquiry. Accordingly, and by virtue of Regulation 23(6) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015 the requirements of paragraphs (4) and (5) of the said Regulation 23 do not apply.
82. Assessment has continued since the submission of the last addendum to ensure that data remains relevant especially in relation to bats. This information has been summarised within the relevant sections of this Technical Report. These confirmatory surveys for bats have been completed since the publication of the Consolidated ES Addendum and are presented in this Technical Report. As bats are not a citation feature of any Natura 2000 or Ramsar sites within 30 km* of the proposed Tyrone – Cavan Interconnector, there is no change to the Appropriate Assessment for the proposed Tyrone – Cavan Interconnector that was undertaken by the Competent Authority (NIEA).

83. No consultation responses have been received regarding ecology since the submission of the last addendum.
84. There have been no relevant policy or legislative changes since the submission of the last addendum that would change the presented assessment.
85. There has been no change to relevant guidance since the submission of the last addendum, with the exception of a new edition of the Bat Conservation Trust guidelines in relation to bat survey. These guidelines do not materially affect the results of bat surveys conducted prior to February 2016, but have been applied to the bat surveys conducted in 2016. The results of these bat surveys have been summarised within this document and the report appended as Appendix 1 and Appendix 2.
86. There has been no significant change to baseline conditions since the submission of the last addendum.
87. As outlined in the Statement of Case and in Construction Technical Report (No. 4), alternative access is required to Tower 40 because of the construction of a chicken shed. Two alternative access tracks are described and assessed in the Construction Technical Report (No. 4). An assessment in terms of ecology for the alternative access tracks is included in that Technical Report.

8.19 Summary and Conclusions

88. This is a summary of the information contained in the Consolidated ES, Chapter 10 - Ecology (page 367 - 368) and Consolidated ES Addendum (page 100).
89. The provision of the proposed substation and the overhead line will have a minimal impact on the ecology of the line route. The habitats present within the survey area are generally ecologically impoverished and of low value both intrinsically and as supporting habitats for protected fauna.
90. The site is dominated by intensive agriculture and the species and habitats reflect this with semi improved and improved grassland and species poor heavily managed hedgerows regularly occurring. Those areas of greater value to biodiversity have been avoided by the proposed Tyrone – Cavan Interconnector and many years of ecological survey have allowed the route to be refined.

91. Mitigation measures are designed to firstly avoid and then minimise impacts on habitats and species of conservation concern through the implementation of good working practices and awareness of the potential impacts of the works on ecological receptors including detailed prescriptions contained within the outline CEMP. Where there is the potential for limited impacts on these receptors, the impacts will be reduced through the adoption of appropriate timing of activities, confirmatory, pre-construction survey of such features as badger setts and bat roosts, and through limiting the extent of actions that will adversely affect habitats of conservation concern. Habitat creation at the substation site will increase the extent of habitats of conservation value, potentially increasing the area suitable for nesting birds.
92. Habitat losses will be restricted in the main to areas of low conservation value, and there will be limited adverse impact on animal species.
93. As stated in the Statement of Case, the proposal avoids all designated areas and impacts upon protected species and habitats have been addressed through the provision of mitigation measures. The impact upon protected species (e.g. badgers) and habitats needs to be balanced against the benefit and need for the proposal, which demonstrably outweighs the minimal impact on ecology.
94. It is also relevant that NIEA Natural Heritage (consultation reply dated 20 August 2015) *"has considered the impacts of the proposal on designated sites and other Natural Heritage interests and based on the information provided and the HRA is content with the proposal with conditions"*.
95. In summary, extensive ecological assessment which shows that with mitigation the long term effects on habitats, species and biodiversity will be negligible. The proposed Tyrone - Cavan Interconnector will have a minimal effect on ecology with no likely significant effects. The Statement of Case explains that the need for the proposal demonstrably outweighs the minimal impact on ecology.