Oweninny Wind Farm Development

Oweninny Power Limited (OPL)

Supplemental EIS (EIS Chapter Updates)

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Executive Summary

The purpose of this EIS Addendum is to provide updated information to An Bord Pleanála (ABP) in relation to the original EIS chapters. The original EIS was submitted to ABP in July 2013 and an Oral Hearing was held in April 2014. A request for further information issued (RFI) from ABP in May 2015.

The RFI requires submission of a revised Environmental Impact Statement (EIS) to incorporate sufficient information to enable ABP to complete an environmental impact assessment in relation to the overall proposal, including the grid connection for Phase 3, in accordance with the requirements of the Environmental Impact Assessment Directive. It also requires submission of a revised appropriate assessment screening report, and if necessary a revised Natura Impact Statement (NIS), in respect of the overall proposal, including the proposed grid connection(s) from Phase 3.

The Project Team spent some time considering the likely or potential grid connection route corridors. However, as a preferred substation location has not yet been identified (as the Grid West project is still at an early stage) it is not possible to provide ABP with sufficient information for it to assess, to the required standard, the grid connection from Phase 3, or even general corridors/alternative routes for same at this time. ABP has therefore been requested to grant permission for Phases 1 and 2 only of the proposed development, which will connect to the existing substation at Bellacorick by means of a grid connection, whose environmental impacts have been fully assessed (full information is contained in the original EIS and this Supplemental EIS). In light of that request, a decision was made to provide further information to ABP in respect of the environmental impacts of Phases 1 and 2 on a standalone basis, i.e. without Phase 3. That information is provided in the "Alternatives" section of this EIS and in particular in the Assessment Report for Phases 1 and 2.

Given the period of almost 2 years between the preparation of the original EIS and the response to the RFI, it was considered prudent to review the EIS chapters and update these with relevant information, as required, in order to allow ABP to carry out its assessment based on best available information.

Of particular significance since 2013, has been the refusal of planning permission in May 2015 by ABP for the development of a 48 turbine windfarm by Coillte on lands at Cluddaun - Reg. Reg. PL16.PA0031, which are adjacent to the proposed Oweninny Windfarm.

However, as OPL is no longer seeking permission for Phase 3 of the Oweninny Wind Farm, it has not included in this supplemental EIS any information or assessment as would relate to that Phase only, e.g. updated photomontages or noise reports showing the impacts of Phase 3 absent Cluddaun.

The updated information since 2013 relates mainly to external factors such as new information published by public agencies and recent developments in the vicinity of the proposed development. The updated information varies from chapter to chapter

and in some chapters no updated information has been published and no updates are made to the relevant chapter.

At the Oral Hearing, which was held in Ballina in April 2014, the Applicant provided witness statements and clarified issues by way of cross questioning. All witness statements were submitted to ABP at the hearing and form part of the planning file. Summaries of the most relevant information in the witness statements and clarifications provided during cross questioning are provided in the chapter updates where necessary.

The updated information and the information presented at the Oral Hearing do not have any significant implications for the proposed development.

The Assessment Report for Phases 1 and 2 concludes that Phases 1 and 2 are capable of proceeding independently of Phase 3, and that the environmental effects in this scenario generally constitute a reduction in potential environmental impacts when compared with Phases 1, 2 and 3 as evaluated in the original EIS. In no instance has an impact been found to be greater than in the original EIS.

Contents

1 Introduction

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The RFI requires submission of a revised Environmental Impact Statement (EIS) to incorporate sufficient information to enable ABP to complete an environmental impact assessment in relation to the overall proposal, including the grid connection for Phase 3, in accordance with the requirements of the Environmental Impact Assessment Directive. It also requires submission of a revised appropriate assessment screening report, and if necessary a revised Natura Impact Statement (NIS), in respect of the overall proposal, including the proposed grid connection(s) from Phase 3.

The Project Team spent some time considering the likely or potential grid connection route corridors. However, as a preferred substation location has not yet been identified (as the Grid West project is still at an early stage) it is not possible to provide ABP with sufficient information for it to assess, to the required standard, the grid connection from Phase 3, or even general corridors/alternative routes for same at this time. ABP has therefore been requested to grant permission for Phases 1 and 2 only of the proposed development, which will connect to the existing substation at Bellacorick by means of a grid connection whose environmental impacts, has been fully assessed (full information is contained in the original EIS and this Supplemental EIS). In light of that request, a decision was made to provide further information to ABP in respect of the environmental impacts of Phases 1 and 2 on a standalone basis, i.e. without Phase 3. That information is provided in the "Alternatives" section of this EIS and in particular in the Assessment Report for Phases 1 and 2.

Given the period of almost 2 years between the preparation of the original EIS and the response to the RFI, it was considered prudent to review the EIS chapters and update these with relevant information, as required, in order to allow ABP to carry out its assessment based on best available information. However, as Oweninny Power Ltd. (OPL) is no longer seeking permission for Phase 3 of the Oweninny Wind Farm, it has not included in this supplemental EIS any information or assessment as would relate to that Phase only, e.g. updated photomontages or noise reports showing the impacts of Phase 3 absent Cluddaun.

1.1 Updates Since 2013

The updated information since 2013 relates mainly to external factors such as new information published by public agencies and recent developments in the vicinity of the proposed development. The updated information varies from chapter to chapter

and in some chapters no updated information has been published and no updates are made to the relevant chapter.

Of particular significance since 2013, has been the refusal of planning permission in May 2015 by ABP for the development of a 48 turbine windfarm by Coillte on lands at Cluddaun - *Reg. Ref. PL16.PA0031*, which are adjacent to the proposed Oweninny Windfarm.

Another significant development was the refusal of planning permission in August 2015 by Mayo County Council for the development of an 8 turbine windfarm by Ecopower Developments Limited on lands at Tawnanasool - *Reg. Ref. MCC14/666*, this area is approximately 12km west of Bellacorick. This application is currently under appeal to An Bord Pleanála - *Reg. Reg. PL16.245355*.

Two 110kV overhead line (OHL) projects also received planning permission within the immediate vicinity of the proposed development. These were the uprate of the existing Bellacorick - Castlebar 110 kV OHL (*ABP Reg. PL16.244534 and MCC Reg. Ref. P14/410*) – granted to EirGrid plc by An Bord Pleanála on 11th August 2015 and the uprate of the existing Bellacorick - Moy 110 kV OHL (*MCC Reg. Ref. P15/45*) – granted to EirGrid plc by Mayo County Council on 4th August 2015.

An application to Mayo County Council has been made in September 2015 by ESB Networks to refurbish/uprate the existing Bellacorick to Bangor Erris 38kV overhead line also, (*MCC Reg. Ref P15/611*)

EirGrid plc also received planning permission on the 14th September 2015 for a minor modification of the existing Bellacorick 110 kV Substation (*MCC Reg. Ref. P15/456*).

Finally, ABO Wind Ireland Limited received planning permission in September 2015 (*MCC Reg. Ref. P15460*) for a temporary (3 year) installation of a 100m high steel lattice, meteorological mast (supported by cable stays) in the Sheskin area.

1.2 Oral Hearing Information

At the Oral Hearing, which was held in Ballina in April 2014, the Applicant provided witness statements and clarified issues by way of cross questioning. All witness statements were submitted to ABP at the hearing and form part of the planning file. Summaries of the most relevant information in the witness statements and clarifications provided during cross questioning are provided in the chapter updates where necessary.

2 Description of Project

2.1 Updates Since 2013

The have been no changes to the description of the project since the preparation of the original EIS. The description remains as described in Chapter 2 of the original EIS and as described in the public notices.

2.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

3 Project Implementation

3.1 Updates Since 2013

The original EIS at section 3.2 described the project phasing. It stated that the project will be developed in 3 phases, which are influenced by grid access availability and construction scheduling and also by the nature of any planning permission granted for the development. It stated that Phase 1 will connect to the existing substation at Bellacorick and construction of this phase is expected to commence by 2014 with completion of Phase 1 by 2016. It stated that Phase 2 will also connect to the existing substation at Bellacorick and construction of this phase is expected to commence by 2016 with completion of Phase 2 by 2018. In relation to Phase 3 it stated that this construction phase is dependent on the implementation of Grid West by EirGrid which will provide a grid connection point for Phase 3 and that construction of Phase 3 was therefore expected to commence in 2018 with completion in 2022.

In relation to Phase 1 and 2, the indicative project timelines have been revised and now indicate that Phase 1 construction will commence in 2016 with completion by 2018 and Phase 2 will commence in 2017 with a completion in 2020, subject to planning permission being granted.

Also in relation, to Phases 1 and 2, OPL can advise that planning consents were granted in 2014 and 2015 to EirGrid for the works at the existing Bellacorick substation (*Mayo County Council Reg. Refs. 14/444 and 15/456*) and for uprates to the existing Bellacorick – Castlebar (*ABP Reg. PL16.24453*) and Bellacorick – Moy 110 kV (*Mayo County Council Reg. Ref. 15/45*) overhead lines, which are required to facilitate the exporting of energy from the proposed Phase 1 and 2 development along the national electricity grid.

EirGrid have advised that the permitted works will be completed by quarter 2 of 2016.

The Supplemental EIS now envisages construction of Phases 1 and 2 commencing in 2016. Should planning permission be granted by ABP, it is intended to commence construction as soon as practicably possible after the permission issues.

The construction of Phase 3 remains dependent on the implementation of Grid West by EirGrid. The current status of the project is that EirGrid published the IEP Report on its website (www.eirgrid.com) in July 2015. At the time of writing of this report, EirGrid have not yet specified a date as to when the Grid West planning application will be lodged.

3.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

4 Alternatives

4.1 Assessment Report for Phases 1 and 2

IN light of the recent High Court decision on the O'Grianna case and the fact that the location of the connection point for phase 3 is not yet determined, OPL has decided not to pursue its application for Phase 3 of the Oweninny Wind Farm at this time. Instead OPL is requesting that ABP grant permission for Phases 1 and 2 of the Oweninny Wind Farm development, the subject of this application, only. For that purpose, an Assessment Report of Phases 1 and 2 only is attached at Appendix 1. This report has regard to the implications arising from the refusal of Cluddaun in particular, as well as having regard to other recent planning applications/decisions in the area as described in Section 3 of this report. The Assessment Report concludes that Phases 1 and 2 are capable of proceeding independently of Phase 3, and that the environmental effects in this scenario generally constitute a reduction in potential environmental impacts when compared with Phases 1, 2 and 3 as evaluated in the original EIS, and in no instance has an impact been found to be greater than in the original EIS.

4.2 Updates Since 2013

The alternatives as described in the original EIS related mainly to alternative generation, sites, configurations and layouts. This section included a full assessment of all overhead line route options and alternatives required to connect Electrical Substations 1 and 2 to the existing Bellacorick substation. Based on this assessment, overhead line routes connecting Phases 1 and 2 formed part of the application to ABP.

It was stated in the original EIS that the exact location of the network connection point for Phase 3 of Oweninny would not be known until planning permission for the EirGrid Grid West project had been obtained and that remains the position. It is apparent from the RFI that further details of the network connection point for Phase 3 are needed (including a description of alternatives considered). At the time of writing of this report, EirGrid are not yet in a position to confirm a date as to when the Grid West planning application will be lodged.

4.2.1 Alternative Development/Phasing Scenarios

As previously detailed in Section 3 of this report, there have been some changes in the external environment which indirectly impact on the proposed development.

The most significant change has been the refusal of planning permission in May 2015 by ABP for the development of a 48 turbine windfarm by Coillte on lands at Cluddaun, which are adjacent to the proposed Oweninny Windfarm.

The timescale for implementation of the Oweninny wind farm has also changed, see **Table 4.1**.

Table 4.1: Indicative Project Phasing

Phase	Rated Output (MW)	Approximate construction period
Phase 1	70 – 90	2016 - 2018
Phase 2	70 - 90	2017 - 2020
Phase 3	190 - 230	Post 2020

In addition to this, a grid connection point for Phase 3 has not yet been determined. At the time of writing of this report, EirGrid have not yet specified a date as to when the Grid West planning application will be lodged.

ABP will be aware from the original EIS that Grid West is the connection point for Phase 3 of the proposed development and was also the intended connection point for the Cluddaun Windfarm.

4.3 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

5 Policy & Planning

5.1 Updates Since 2013

There have been no significant changes in national, regional or local planning and energy policies and plans since the preparation of the original EIS. Some updates on EU targets, climate change issues and meeting national targets have been provided in more recent reports published primarily by the Environmental Protection Agency (EPA).

The Mayo County Development Plan (CDP) 2008 – 2014 was the relevant CDP in force at the time the original EIS was prepared. This was subsequently replaced when the Mayo CDP 2014 – 2020 was adopted by MCC in April 2014, during the Oral Hearing. References are made in other chapter updates to the latest CDP where appropriate to that topic.

However, it should be noted that the Mayo Renewable Energy Strategy (RES) was adopted in 2011 as an amendment to the Mayo CDP 2008 – 2014, and this was in force at the time the original EIS was prepared.

The same RES remains part of the Mayo CDP 2014 – 2020 and the original EIS was prepared in the context of this strategy.

As previously described in Section 3 of this report, there have been external changes in the vicinity of the proposed development, in particular the refusal of the windfarm at Cluddaun and the appeal currently before ABP for the 8 turbine windfarm at Tawnanasool, as well as fact that a grid connection point for Phase 3 has not yet been determined.

5.1.1 Updates on EU Policy and Commitments

Further to the Renewable Energy Directives binding targets to 2020, the European Commission acknowledged the growing concerns and clear message of the Intergovernmental Panel on Climate Change (IPPC) Assessment Report 5 (AR5). In October 2014 EU leaders agreed a 2030 climate & energy framework on that will see a domestic EU greenhouse gas reduction target of at least 40% compared to 1990 to drive continued progress towards a low carbon economy in the European Union. To achieve this target it is estimated that:

- the sectors covered by the EU Emission Trading Scheme (ETS), including energy, would have to reduce emissions by 43% compared to 2005.
- emissions from the non-ETS sectors would have to reduce by 30% compared to 2005 levels. The effort needed to meet these targets will be shared equitably between Member States.

In addition, an EU level 2030 target for renewable energy is proposed with, at least, 27% of EU energy consumption to come from renewable sources. This renewable energy target does not, however, place binding targets on Member States and is to be reached by the EU as a whole. Renewable energy will therefore play a key role

in the transition towards a competitive, secure and sustainable energy system for the EU.

In relation to energy efficiency, the European Commission proposed a 30% energy savings target for 2030, following a review of the Energy Efficiency Directive. The European Council, however, endorsed an indicative target of 27% to be reviewed in 2020 having in mind a 30% target.

The Environment Council of the EU approved the EU's intended nationally determined contribution in March 2015, which is to achieve at least 40% domestic reduction in greenhouse gas emissions compared to 1990 levels by 2030. This translates the agreement by EU leaders in October 2014, referred to above, on the EU 2030 climate & energy framework.

A new global international climate change agreement is currently being negotiated under the UN Framework Convention on Climate Change (UNFCCC). It is expected that this will be agreed by the 21st Conference of Parties (COP21) which will be held in Paris in December 2015. Such agreement will come into effect in 2020. The 40% reduction in greenhouse gases agreed by the EU Leaders is the EU proposed contribution to this new international agreement.

5.1.2 Climate Change

The Inter Governmental Panel on Climate Change (IPCC) report, "*Climate Change 2013: The Physical Science Basis*", referred to as the Fifth Assessment Report (AR5), presents clear and robust conclusions in a global assessment of climate change science. The report clearly indicates with 95 per cent certainty that human activity is the dominant cause of observed warming since the mid-20th century. The Working Group 1 Report Approved for Policy Makers has also been published in 2013 and summarises the main findings of the AR5. The AR5 Report confirms that warming in the climate system is unequivocal, with many of the observed changes unprecedented over decades to millennia: warming of the climate system is occurring with increased atmospheric and sea temperatures, reduction in snow and ice cover, sea level rise and increasing greenhouse gas concentration in the atmosphere. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since.

Tackling climate change is a key element of the European Commissions energy road map going forward to 2050.

Historically, in response to international concerns, under the UN Framework Convention on Climate Change (UNFCCC), industrialised countries were to stabilise their greenhouse gas emissions at 1990 levels by the year 2000. The EU met this commitment. The Kyoto Protocol to the UNFCCC committed the 15 countries that were EU members at the time to reduce their collective emissions in the 2008-2012 period to 8% below 1990 levels.

Recent statistics show that the level of the EU 28's greenhouse gas emissions had fallen to 4.7 Billion tons by 2012, a 17.9% reduction compared to 1990.

Achieving the targets aspired to in the 2050 Roadmap would reduce the emission of greenhouse gases by 80 – 95% by mid century.

In the National context the Irish Environmental Protection Agency also highlights its concerns around climate change and Ireland's ability to achieve its targets:

"What is distinctive about the current period of global warming, compared to previous cycles of climate change, is the extent and rate of change, which exceeds natural variation. The impacts of climate change present very serious global risks and threaten the basic components of life, including health, access to water, food production and the use of land. As the earth gets warmer the damage from climate change will accelerate".

In its report "*Ireland's Provisional Greenhouse Gas Emissions*" the EPA also indicates that

"For 2013, total national greenhouse gas emissions are estimated to be 57.81 million tonnes carbon dioxide equivalent (Mt CO2 eq) which is 0.7 % lower (or 0.41 Mt CO2 eq) than emissions in 2012 (58.22 Mt CO2 eq). This reverses the 1.0% increase in emissions reported for 2012."

Agriculture remains the single largest contributor to the overall emissions at 32.3% of the total. Energy and Transport are the second and third largest contributors at 19.6% and 19.1% respectively. The remainder is made up by the Industry and Commercial at 15.4%, Residential sector at 11.1% and Waste at 2.5%.

The EPA's 2015 Report on Ireland's Greenhouse Gas Emission Projections 2014 – 2035 provides an updated assessment of Ireland's progress towards achieving its emission reduction targets set down under the EU Effort Sharing Decision (Decision No 406/2009/EC) for the years 2013-2020. Although this report identifies key challenges in the non emission trading sectors of agriculture, transport and heating it also predicts two possible scenarios for the energy sector as follows:

- Under the With Measures scenario, total energy sector emissions are projected to increase by 11% over the period 2013 – 2020 to 13 Mt CO2eq12. The increase is driven by increased demand for electricity with coal-fired power generation being maintained and gas-fired generation increasing by over 20%. By 2020 22% of electricity generation is projected to come from renewable sources.
- Under the With Additional Measures scenario, total energy sector emissions are projected to decrease by 14% over the period 2013 – 2020 to 10 Mt CO2eq. In this scenario, energy demand is lower than the With Measures scenario as a result of improved energy efficiency and also renewable energy is assumed to reach 40% penetration by 2020. The largest renewable energy contribution comes from wind, which is estimated to be significantly higher than in the With Measures scenario in terms of generation input.

To achieve Ireland's commitments to 2030 and to continue to decarbonise the economy to 2050 greenhouse gas reductions across all sectors must be achieved. This is in line with the EU Effort Sharing Decision (No. 206/2009) which requires all

sectors to contribute to achieving emission reductions. The importance of achieving a 40% renewables penetration in the energy sector is a key component of this, with wind energy contributing most significantly.

5.2 Oral Hearing Information

No new information was provided at the oral hearing in relation to this topic. The witness statement reiterated the compatibility of the proposed development with all relevant national, regional or local planning and energy policies and plans.

6 Human Beings

6.1 Updates Since 2013

There have been no significant changes in relation to this chapter since the preparation of the original EIS. It remains the case that the overall benefits to human beings will be positive, increasing economic activity and providing employment opportunities in an area deprived of such opportunities. The fact that Phase 3 of Oweninny will not be implemented at this time means that construction related activities and associated benefits to human beings will occur over a 5 year period as opposed to a potential further 5 years beyond that.

6.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

7 Noise

7.1 Updates Since 2013

Since the original EIS was prepared the Department of Environment, Community and Local Government (DECLG) has been engaged in public consultation and partial review of the Planning Guidelines for Wind Energy Development. At the time of this chapter update to the EIS no change to the 2006 guidelines has been published. Considerations regarding noise and shadow flicker therefore remain based on the existing (2006) guidelines.

In the original EIS chapter, Tables 7-1 (page 7.2) and 7-3 (page 7.3) contain a typographical error as they reference H32 as a background noise monitoring location whereas the correct reference should read H23. Subsequent tables and all of the data analysis in the original EIS are based on H23.

No significant changes or developments have been carried out in the study area that would give rise to a significant change in background noise levels. The baseline data is therefore regarded as current. However, there will be a change in cumulative noise impact associated with other windfarms as Cluddaun wind farm has been refused planning and there will be no cumulative impact associated with noise from this wind farm. In addition, as planning for Phase 3 of Oweninny is no longer sought there will be a reduced predicted noise impact with Oweninny Phase 1 and 2 acting alone and cumulatively with Corvoderry. A new Noise prediction model has been prepared and the results are provided in the Phase 1 and 2 assessment report.

7.2 Oral Hearing Information

Issues raised at the oral hearing included the existing low background noise levels and the likely impact on some locations due to the construction of the wind farm. It was clarified that the proposed noise limits at lower wind speeds would be set at a lower limit of 37.5 dBA at specific properties identified in Table 7.15 of the EIS.

8 Shadow Flicker

8.1 Updates Since 2013

The guidance limits set down in the Department of Environment, Heritage and Local Government (DoEHLG) Wind Farm Planning Guidelines (2006) were used in the original EIS to assess the potential impact of shadow flicker on nearby residences. While these Guidelines are expected to be updated at a future date, the 2006 Guidelines remain the prevailing guidance document for the purposes of shadow flicker assessment.

8.2 Oral Hearing Information

Based on observations made in third party submissions, a number of additional mitigation measures were proposed within the witness statement submitted as part of the oral hearing process. These can be summarised as follows:

- It is evident that, without operational constraints, the expected occurrence of shadow flicker at Oweninny will be low and will be well below the accepted limits of tolerance. However, out of an abundance of caution, a shadow detection and control system will be installed on turbines within ten rotor diameters of all existing dwellings, which have the potential to be impacted by shadow flicker, in order to prevent shadow flicker exceeding guidance levels at any property.
- The applicant will contact the owner of property H19 (as shown in Figures 8.1 and 8.2 of the EIS) with a view to establishing the use of the rooms which have the potential to be impacted by shadow flicker. In any event, as stated above, a shadow detection and control system will be installed on the turbines which have the potential to cause shadow flicker at this property to ensure that shadow flicker guideline levels are not exceeded.
- It is proposed to implement the following procedure for recording, reporting and handling any complaints relating to shadow flicker during the operation of the Oweninny Wind Farm.
    - The developer, OPL, will implement a procedure for the recording, investigating and reporting of public complaints for which the wind farm site operations manager will be responsible. This procedure will be subject to review by the OPL management. It will be a requirement that all complaints are investigated on receipt of complaint and that such complaints are immediately notified to the OPL management.
    - In the case of a shadow flicker complaint, an appropriately qualified person will investigate the potential for shadow flicker to have occurred by way of computer modelling and an analysis of meteorological data recorded by Met Eireann.

- As set out above, a shadow detection and control system will be installed on all turbines within ten rotor diameters of any existing dwelling which has the potential to experience shadow flicker and will be implemented as required during the operational phase. If it is determined that the annual guidance limits could have been reached at a residence at any point during the lifetime of the wind farm, the developer will take immediate steps to shut down relevant turbines at further times when shadow flicker could potentially occur in the relevant 12 month period.

9 Terrestrial Ecology

9.1 Updates Since 2013

9.1.1 Update of list of 'Birds of Conservation Concern in Ireland'

A new list of Birds of Conservation Concern in Ireland for the period 2014 - 2019 was published in late 2013 (Colhoun & Cummins 2013, *Irish Birds* Vol.9: 523-544). The bird surveys for the EIS were evaluated using the 2008 - 2013 list by Lynas et al. (2007, *Irish Birds* Vol 8: 149-166).

The principal changes involving species which occur on the Oweninny cutaway bog site are as follows:

Green list to Red list

Meadow Pipit	short-term decline in breeding population
Grey Wagtail	short-term decline in breeding population

Amber list to Red list

Tufted Duck	short-term decline in non-breeding population
Woodcock	long-term decline in breeding range (breeding & winter populations also given Amber status on basis of European status SPEC)

Green list to Amber list

Sparrowhawk	short-term decline in breeding population
Robin	short-term decline in breeding population
Stonechat	short-term decline in breeding population
Mistle Thrush	short-term decline in breeding population
Goldcrest	short-term decline in breeding population

Amber list to Green list

Ringed Plover	50% of wintering population at >10 sites
Greenshank	50% of wintering population at >10 sites
Grasshopper Warbler	short-term increase in breeding population

The most significant change in the context of the birds which occur at the Oweninny Windfarm site is that **Meadow Pipit** is now Red listed – this is a widespread and common species throughout the entire site both in summer and winter. However, this change does not affect the evaluation of impacts on birds at the site. In section 9.4.8.2 of the original EIS, the following is noted:

> "*Generally, wind farm developments can be expected to have fewer effects on passerine species than on waterfowl or birds of prey (Devereux et. al. 2008). There may actually be beneficial effects for some species as recent research by Pearce-*

> *Higgins et al. (2012) suggests potential positive effects of wind farm construction on skylarks, meadow pipits and stonechats. Such effects may result from vegetation disturbance during construction creating greater openness in the sward structure, known to benefit these species (though at Oweninny there already are vast areas of open habitats, as reflected by the high numbers of skylarks and meadow pipits).”*

The elevation to Red list of **Grey Wagtail**, which occurs sparsely along the main rivers on site, does not affect the evaluation of impacts on birds at the site as this species will be unaffected by the works on the cutaway bog away from the rivers.

The elevation to Red list of **Tufted Duck**, which occurs in small numbers during winter on Lough Dahybaun, does not affect the evaluation of impacts on birds at the site as this species will be unaffected by the works on the cutaway bog away from the lake.

The elevation to Red list of **Woodcock**, which occurs on site during autumn and winter close to the conifer plantations, but could breed is of some note as part of the habitat used by this species (conifer plantation) will be removed to facilitate the project. However, conifer plantation is widespread in northwest Mayo and in any event some forest will still remain on site. (It is of course noted that the natural habitat for this site, blanket bog, would not have supported Woodcock in the past).

The five species elevated to Amber list occur throughout the site though these are associated with scrub and conifer forest rather than the open bog habitats. The elevation of these to Amber list does not affect the evaluation of impacts on birds at the site.

While **Ringed Plover** and **Greenshank** are downgraded to the Green list, this is on the basis of the wintering population in Ireland. As breeding bird populations, such as occur at Oweninny, are still of significance, it is recommended that these two species are still treated as sensitive breeding species for the purpose of mitigation measures (see Table 9-31 in the original EIS). It is noted that the Bird Atlas 2007 - 2011 (Balmer et al. 2013) recorded a long-term decline of 23% in the breeding Ringed Plover population in Ireland and did not record any records of breeding Greenshank in Ireland for the period.

9.1.2 Designated Sites

Since preparation of the original EIS chapter in 2013, there have been no further sites in north-west Mayo designated for conservation by the Department of Arts, Heritage and the Gaeltacht (www.npws.ie).

9.1.3 Conservation Objectives

Since the preparation of the original EIS and NIS in 2013, site specific Conservation Objectives have been published by National Parks and Wildlife Service for two of the listed European sites:

- **Broadhaven Bay SAC,** NPWS (2014) Conservation Objectives: Broadhaven Bay SAC 000472. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. (dated 11 Feb 2014).
- **Blacksod Bay/Broad Haven SPA,** NPWS (2014) Conservation Objectives: Blacksod Bay/Broad Haven Bay SPA 004037. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. (dated 16 December 2014)

The conservation objectives for all the other European sites are still generic (see www.npws.ie).

The publication of the Conservation Objectives for the above two sites does not alter the results of the AA Screening Assessment as carried out.

9.1.4 Breeding Bird Survey 2015

A breeding bird survey was undertaken within the Oweninny Windfarm site between 30th June and 3rd July 2015 to update the baseline information as presented in the original EIS (i.e. which was based on data for 2010-2012). A partial bird survey had also taken place on site in early June 2015.

The methods used were as in previous surveys, with a combination of transect walks, selected Vantage Point watches, and focused search of habitats for scarcer species.

While the survey was carried out relatively late in the breeding season, it is considered that this was not a significant limitation as birds present were still in the active stage of nesting, with fledged young recorded for some species. Also, it is generally accepted that breeding in the 2015 season was slower than normal due to cool weather in spring and early summer.

Overall, the diversity and distribution of breeding birds on site was similar to earlier years, with the following species of conservation importance recorded breeding on site (using standard possible / probable / confirmed categories of proof):

- Little Grebe
- Teal (fledged young seen)
- Sparrowhawk
- Kestrel (probable)
- Red Grouse (present)
- Ringed Plover
- Dunlin (see discussion)
- Snipe
- Greenshank (see discussion)

- Common Sandpiper
- Common Gull
- Skylark
- Meadow Pipit
- Robin
- Stonechat
- Wheatear (young seen)
- Starling
- Linnet

The most significant finding of the survey was the probable breeding by **Dunlin**. Two birds were recorded in wetland habitat to the northwest of Bellacorick Iron Flush, with one heard singing/reeling. One of the birds appeared agitated, indicating a nest location nearby. Two Dunlin had also been recorded in the same area in early June 2015.

A single Dunlin had been recorded in the same general area in June 2012 and two birds had been here in June 2013.

From the above series of observations, it seems certain that Dunlin is established as a breeding species on site. This is significant as Dunlin is a Red listed species and the race which breeds in western Ireland, *Calidris alpina schinzii*, is listed on Annex I of the Bird Directive. The breeding population in Ireland is considered to be less than 150 pairs (Wings 77: 20-21).

While **Greenshank** was not recorded in the July survey, a single bird had been recorded in early June 2015. This was in the same area as one had been seen in 2012 and 2013. As before, this bird was showing breeding behaviour but only one individual was ever seen. While breeding by Greenshank at Oweninny cannot be ruled out, the evidence from the now three survey years would indicate that this is a returning individual in search of a mate.

It is noted that **Golden Plover** was not recorded on Boyles Bog where territorial birds had been present in the surveys in 2010 to 2012. However, a breeding attempt may well have been made earlier in the season (birds can be expected on territory from early April).

Significance of 2015 Survey Results in Context of the Proposed Development

While the 2015 survey confirmed with a high degree of certainty that Dunlin is now an established breeding species on site, this finding does not alter the assessment of impacts on birds as carried out for the EIS. However, it does reiterate the need for mitigation (as described in section 9.5.12 of the original EIS) to avoid disturbance to sensitive breeding species such as Dunlin and potentially Greenshank.

The survey also showed that the breeding bird community on the Oweninny site, as described in detail in the EIS, is fairly stable over time. This stability will add value to the proposed monitoring programme (section 9.5.14 of the original EIS) as changes in bird populations, which may be due to local habitat changes as a result of the wind farm development, will be detectable over time.

9.2 Oral Hearing Information

Based on observations made in the submission from the Department of Arts, Heritage and the Gaeltacht (DAHG) the submissions, clarifications were provided through the witness statement submitted as part of the oral hearing process. Extracts from the witness statement of the key issues raised during the consultation period are provided below.

Submission by Department of Arts, Heritage and the Gaeltacht

- **Issue No. 1: Identification of Conservation Objectives of Natura 2000 Sites**

This was discussed at the OH and a response was given in the Witness Statement under item no. 3.1.1.

It is noted that a summary table was presented in the Witness Statement which listed the Qualifying Interests for all sites excluded at State 1 (Screening) of the AA and also summarised the reason(s) for exclusion (this table is now included in the amended NIS).

To further aid the Oral Hearing process, a 16 page document was presented to the Inspector, which gave details of the relevant qualifying interests of the sites and the reason why the interests, and hence the conservation objectives for the sites, would not be affected by the proposed windfarm development ('Summary Details of Process for Screening of Designated SPA/SAC Sites for Appropriate Assessment'). This document also considered SPA sites in northwest Mayo at distances in excess of 15 km from Oweninny (namely Killala Bay/Moy Estuary SPA & Illanmaster SPA).

With the clarifying and additional information (in support of the NIS) presented at the Oral Hearing, it was considered that the concern raised by the Department in relation to the conservation objectives of sites was fully addressed.

- **Issue No. 2: In-Combination Effects**

This was discussed at the OH and a response was given in the Witness Statement under item no. 3.1.2.

The section of the NIS on "in-combination effects" has now been updated since the Oral Hearing to take into account the issues discussed at the Oral Hearing and also events since then (such as publication by EirGrid in July 2015 of the report prepared for the Government appointed Independent Expert Panel). This detailed update is presented in an amended NIS.

- **Issue No. 3: NIS Supported by Relevant Chapters in EIS**

This was discussed at the OH and a response was given in the Witness Statement under item no. 3.1.3.

It is noted that the amended NIS has been supplemented with relevant extracts of the expert testimony from the Witness Statements of Dr. Paul Jennings (Peat Stability), Dr. Paddy Kavanagh (Dust emissions from batching plant) and Mr Michael Gill (Hydrology and Bellacorick Iron Flush SAC).

- **Issue No. 4: Birds – Collision Risk**

The Department noted that there should be further consideration of the collision risks, notably for the larger Birds Directive Annex I species which occur in the area, Whooper Swan and Greenland White-fronted Geese.

A detailed response was presented in Section 3.1.4 of the Witness Statement. This stressed that the surveys carried out over 2 winters showed that there are no regular flocks of Whooper Swan of significant size in the Oweninny/Bellacorick area. This is thought to reflect the poor feeding opportunities presented by the lakes in the area, which are oligotrophic to dystrophic in nutrient status. The response also reviewed the past and recent status of Greenland White-fronted Geese population on the Bellacorick bogs and highlighted that the geese had deserted these bogs with the arrival of large scale commercial peat harvesting.

As the studies carried out for the Oweninny project, as well as studies at the time for other wind farm projects (namely Corvoderry and Cluddaun), showed that swans and geese are genuinely rare in this area of northwest Mayo, it can be concluded that there is no significant risk of collision with turbines as a result of the development. It is noted further that when swans occur on site (maximum of 5 recorded), movements on site between lakes is typically below 20 metres height (so as to minimise energy usage) – this is well below the rotor sweep of the turbines (64 metres).

Possible “In-combination effects” with other wind farms and with power lines, as raised in the Department’s submission, were discussed in the Witness Statement. These are further reviewed to include more recent information on projects since the Oral Hearing in the In-combination section of the amended NIS.

- **Issue No. 8: Birds – Hen Harrier**

The Department noted the importance of the winter Hen Harrier roost in the Lough Dahybaun area. It also suggested that it is probable that usage of the site by this species is far more than recorded, and accordingly recommended that Turbines T103, T108 and T109 be removed further away from the present proposed positions as this species uses a wide expansive range.

A detailed response was made to the Oral Hearing in point no. 3.1.8 of the Witness Statement. It was noted that detailed surveys following standard methods had been carried out to assess the usage of the site by Hen Harriers (as detailed in section 9.2.2.2 of EIS). The surveys demonstrated that there is very occasional usage of the main area of the site during day time. The harriers arrive at the roost from the adjoining countryside to the east and south of the site where it can be

assumed they were hunting during the day. Similarly, they depart in these directions in the morning.

It is noted that the Department's claim that the Hen Harriers are known to fly to and from the roost in all directions, including to the north through the wind farm site, is contrary to the findings of the systematic surveys carried out over 2 winters for the EIS and was not substantiated by any details.

The attention that was given to the layout of the turbines in the vicinity of the Hen Harrier roost so as to ensure that there would be no significant disturbance to the Hen Harriers as a result of the turbines or significant risk of collision is described in the Witness Statement.

- **Issue No. 9: Bellacorick Iron Flush**

The issues raised by the Department were largely dealt with in the Witness Statements of Mr Michael Gill (hydrologist) and Dr Paddy Kavanagh. Information from these statements has now been incorporated into the amended NIS to provide more supporting evidence that the Oweninny Wind Farm project will not adversely affect the integrity of the Bellacorick Iron Flush cSAC, having regard to its conservation objectives.

9.3 Exclusion of Phase 3

Although no significant impacts on terrestrial ecology were identified in the original Oweninny EIS for all three phases; the exclusion of Phase 3 would also reduce the level of potential impact of the development overall. In particular there would be no potential to impact on the Formoyle flush area, Lough Dahybaun SAC lake and the Deel/Moy river system. There would be less potential to impact on the Hen Harrier winter roost which is located to the east of Lough Dahybaun.

10 Water & Aquatic Ecology

10.1 Updates Since 2013

There have been no significant updates since the original EIS was prepared. The only relevant update relates to Environmental Protection Agency (EPA) biological monitoring data for the rivers draining the Oweninny site. The (EPA) carries out biological water quality assessments on a rolling three year basis at river sites in Ireland as part of the Water Framework Directive river monitoring programme. The biological quality data collected is used in the status assignment of river water bodies in conjunction with other water quality parameters and were obtained from the EPA geoportal website (http://gis.epa.ie/DataDownload.aspx). *Table 10.1* provides an updated version of Table 10.9 in the original EIS based on 2013 data from the EPA.

The updated information does not alter the assessment of potential impacts as stated in the original EIS.

Although no significant impacts on aquatic ecology were identified in the original Oweninny EIS for all three phases, the exclusion of Phase 3 would exclude the potential for impact on Lough Dahybaun SAC lake as the development footprint of Phase 1 and 2 would be outside the catchment area. Similarly, there would be no potential for impact on the Deel/Moy river system and the associated Freshwater Pearl Mussel population located there, or the salmonid species of the Moy system. No impact would be possible on the Cloonaghmore catchment flowing eastward from the Phase 1 and 2 development also.

10.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

Table 10.1*: *EPA Biological Monitoring Data

Site Code	Station name	River	LAST Year EPA Q value recorded	Q VALUE	River Water Body Status	River Water Body Code
RS33M010100	Just u/s Owenmore River	Muing	2008	4	Good	IE_WE_33_2157
RS33O040050	Br SE Srahnakilly	Owenmore (Oweninny)	2011	4	Good	IE_WE_33_3204
RS33O040090	300 m u/s Bellacorick Bridge	Owenmore (Oweninny)	1990	4-5	High	IE_WE_33_3204
RS33O040100	Bellacorick Bridge	Owenmore (Oweninny)	1990	5	High	IE_WE_33_3204
RS33O040150	1.1 km d/s Bellacorick Br	Owenmore	2005	4-5	High	IE_WE_33_3204
RS33O040250	S. of Tawnaghmore (nr School)	Owenmore	2011	4-5	High	IE_WE_33_3204
RS33O040270	W. of Largan	Owenmore	2011	4-5	High	IE_WE_33_3204
RS33S030150	Bridge 1 km u/s Oweninny R	Owenmore (Sheskin Stream)	2011	4-5	High	IE_WE_33_3204
RS34C030060	Bridge near Lecarrownwaddy	Owenmore/Cloonaghmore	1989	5	High	IE_WE_34_397
RS34C030100	Bridge near Belville	Owenmore/Cloonaghmore	2013	4	Good	IE_WE_34_397
RS34C030150	Ballintober Bridge	Owenmore/Cloonaghmore	2013	4-5	High	IE_WE_34_397
RS34C030200	Tonrehown Bridge	Owenmore/Cloonaghmore	2013	4	Good	IE_WE_34_3976
RS34C030270	1.2 km u/s Palmerstown Br	Cloonaghmore	2013	4	Good	IE_WE_34_3976
RS34C030280	200 m u/s Palmerstown Bridge	Cloonaghmore	1989	4	Good	IE_WE_34_3976
RS34C030310	Palmerstown Bridge (RH side)	Cloonaghmore	1989	4	Good	IBAS_ID WE 291

Site Code	Station name	River	LAST Year EPA Q value recorded	Q VALUE	River Water Body Status	River Water Body Code
RS34D010025	Ford S.W. of Knockbrack	Deel	2013	4	Good	IE_WE_34_3896_1
RS34D010050	Ford at Ballymulty	Deel	1984	5	High	IE_WE_34_3896_2
RS34D010100	Ford E. of Ballycarroon House	Deel	2013	4-5	High	IE_WE_34_3896_3
RS34D010120	Crossmolina Bridge	Deel	2013	4	Good	IE_WE_34_3896_3
RS34D010150	S.E. of Crossmolina	Deel	1993	4	Good	IE_WE_34_3896_3
RS34D010200	800 m d/s Crossmolina Bridge	Deel	2005	4-5	High	IE_WE_34_3896_3
RS34D010250	NW Rectory near old Abbey	Deel	2005	4	Good	IE_WE_34_3896_3
RS34D010300	Knockadangan Bridge	Deel	2013	4-5	High	IE_WE_34_3896_3
RS34D010400	Bridge at Castle Gore	Deel	2013	4-5	High	IE_WE_34_3896_3
RS34D030800	Br u/s Cloonaghmore River	Duvowen River	2013	4	Good	IE_WE_34_2800
RS34F060100	Eskeragh Bridge	Fiddaunatooghan (Deel)	2013	4	Good	IE_WE_34_3820
RS34S010200	E. of Shanvolahan	Shanvolahan	1989	4-5	High	IE_WE_34_228
RS34S010300	Bridge S.W. of Coolturk	Shanvolahan	2010	4	Good	IE_WE_34_448
RS34S010400	Just u/s Deel River confluence	Shanvolahan	2013	4	Good	IE_WE_34_1254

11 Landscape

11.1 Updates Since 2013

The Mayo County Development Plan 2008 – 2014 has now been replaced by the Mayo County Development Plan 2014 – 2020. This document contains the statutory plans controlling development in the area and also includes the Landscape Appraisal of County Mayo. A review of the Landscape Appraisal has identified that it remains largely unchanged and as such does not necessitate an update to the landscape and visual assessment. In addition, the Renewable Energy Strategy for County Mayo included as supplementary documentation to the 2014 – 2020 development plan remains unchanged from the previous development plan.

11.1.1 Guidance Documents

In April 2013, the third edition of the guidelines for Landscape and Visual Impact Assessment (GLVIA3) was published by the Landscape Institute. Following this publication, the Landscape Institute provided the following advice regarding its adoption for LVIA projects which commenced prior to the 2013 adoption date. It states that:

> *"An assessment started using GLVIA2 should be completed using that edition. However, if in the view of the professional a comparison should be undertaken with GLVIA3, and subsequently if necessary a re-assessment undertaken according to GLVIA3, then this should be discussed and agreed with the client in the first instance"*; it further states that: *"In general terms the approach and methodologies in the new edition are the same. The main difference is that GLVIA3 places greater emphasis on professional judgement and less emphasis on formulaic approach."* (Source: Landscape Institute website).

GLVIA3 was published and came into force on 17th April 2013, long after work on the LVIA for Oweninny Wind Farm had commenced. The adoption of GLVIA2, for the duration of the assessment, is therefore considered to be consistent with the guidance from the Landscape Institute's Technical Committee.

A small number of other guidance documents have also been updated since 2013 but these would not have a material difference to the approach taken or the findings of the assessment.

11.1.2 Updated Photomontages and Figures

Arising primarily from the refusal of the 48 turbine windfarm by Coillte on lands at Cluddaun which are adjacent to the proposed Oweninny Windfarm and the current planning appeal for the 8 turbine windfarm on lands at Tawnanasool approximately 12km west of Bellacorick the photomontages and figures submitted as part of the original EIS have been updated so show the visual effects arising from these projects, taking account also of the fact that Phase 3 will not be developed at this

time. These updated photomontages and figures can be found at Photomontages for Appendix 1 Assessment Report for Phases 1 and 2.

11.2 Oral Hearing Information

The following provides details of additional information relating to the landscape and visual assessments that were provided at the Oral Hearing in April 2014.

11.2.1 Location of Photomontages

The following clarification and additional details of the photomontages and viewpoints was provided at the Oral Hearing.

Photomontages have been produced from viewpoints, which are representative of the nature of visibility at various distances and in various contexts. It is not feasible to produce photomontages from every possible viewpoint in the study area. Photomontages are used as a tool to come to understand the nature of the residual effects. The selection process of viewpoint locations is as follows:

- The location of viewpoints within the study area is informed by site survey, mapping and predicted Zones of Theoretical Visibility (ZTV);
- Visual impact mapping of open and intermittent views during site surveys assess the potential visibility of the proposed development from settlements, national, regional and main local roads including scenic roads, scenic viewpoints as well as from cycling and walking routes, relevant mountain tops and other landscape designations such as national parks etc.;
- Identification and selection of representative viewpoints showing typical open or intermittent views within a local area, which will be frequently experienced by a range of viewers;
- Identification and selection of specific viewpoints from key viewpoints in the landscape such as routes or locations valued for their scenic amenity, main settlements etc.;
- Confirmation of viewpoint locations to be used for photomontages by the client and relevant planning authorities consulted during the preparation of the EIS.

Viewpoint selection has been carried out according to the best practice standards and industry guidelines as used for the original EIS; this means that the original LVIA and this new report remain able to be compared:

- Visual Representation of Windfarms - Good Practice Guidance, Scottish Natural Heritage, 29 March 2006.
- Photography and Photomontage in Landscape and Visual Impact Assessment, Landscape Institute Advice Note 01/2011.
- Planning Guidelines for Wind Energy Development, Department of Environment, Heritage and Local Government, 2006.

11.2.2 Additional Viewpoints

The following two viewpoint locations were also produced for the oral hearing to supplement submissions made by local residents of the Shanvolahan area. Photomontages illustrating the impact of the proposed development have been presented at the Oral Hearing in April 2014.

Photomontage A: View northwest from local road in the townland of Shanvolahan

Visual Zone	Primary Principal Visual Zone
Description of view	This viewpoint is located on a minor road to the south-east of local residential properties in the townland of Shanvolahan. The view looks north-west towards the near horizon formed by rising topography. An individual house with adjacent pasture land, a group of small trees, coniferous woodland plantation and a small scale transmission line define the fore-to-middle ground. The wind farm will be visible from this location, seen in the background of the view along the horizon.
Visual Effects	The lower parts of the wind farm will be partially screened by intervening topography and vegetation. From this location the turbines are laid out harmoniously, spaced fairly regularly across the horizon. Minimal visual confusion will arise as a result of overlapping turbines. The turbines will be seen against the sky and as a result there is no defining background to which they can be measured. The turbines will form immediately apparent features of the scene, changing its overall character due to the introduction of tall, moving vertical elements. Despite the number of turbines visible and their proximity to the viewpoint, the underlying visual landscape will not become subordinate as the turbines will appear at equilibrium with, or subordinate to the scale of other elements within the view, and there is no defining background which the turbines can be measured against. The visual effects will be Substantial. The blades and blade tips of several of the proposed Corvoderry Wind Farm are visible on the wireline image, seen just above the horizon. In actuality, as demonstrated by the photomontage image, these structures will be screened by intervening vegetation. As a result, no cumulative effects are predicted to arise at this location.
Landscape Effects	The landscape character is influenced by human interaction. The view is defined by managed, pastoral agricultural land use. Coniferous woodland plantation is further evidence of the managed nature of the landscape. Built form is visible in terms of residential dwellings and associated infrastructure including the highway and telegraph poles. The wind turbines will introduce a prominent energy harvesting character into this landscape. The man-made nature of the proposed wind farm will considerably intensify the existing man-made character and partially modify the existing landscape character. As a result of its scale and extent, the proposed wind farm will become a new, prominent feature of the landscape, although not uncharacteristic with the underlying character of a landscape influenced by human interaction. The landscape effects are therefore considered High.

Photomontage B: View northwest from a private access road in the townland of Shanvolahan

Visual Zone	Primary Principal Visual Zone
Description of view	This viewpoint is located on a private access road to the south-east of local residential properties in the townland of Shanvolahan The foreground to middle ground of the view is defined by amenity grassland and established pastoral grazing land, hedgerows punctuated by occasional hedgerow trees and coniferous woodland planting. Built elements are visible in the form of an individual residential dwelling, small scale transmission line which spans the view and medium scale agricultural buildings in the background.
Visual Effects	The lower parts of the wind farm will be partially screened by intervening localised topography and vegetation. From this location the turbines are spaced irregularly across the horizon. Some limited visual confusion will arise as a result of overlapping turbines. The proposed turbines will be visible against the sky. The turbines will form immediately apparent features of the scene, changing its overall character due to the introduction of tall, moving vertical elements. Despite the number of turbines visible, and their proximity to the viewpoint, the underlying landscape will not become subordinate as they will appear at equilibrium with, or subordinate to the scale of other elements within the view, and there is no defining background which the turbines can be measured against. The visual effects will be Substantial. The proposed Corvoderry Wind Farm will result in cumulative effects in combination. The Corvoderry wind farm will be perceived as part of the Oweninny Wind Farm in this view since the schemes cannot be separated visually from each other.
Landscape Effects	The landscape character at this location is defined by human interaction. The view is characterised by pastoral agriculture land use, amenity grassland and coniferous woodland planting. Built form is conspicuous in terms of residential dwelling and associated infrastructure including small scale transmission lines and medium scale agricultural out buildings. While the nature of the proposed wind farm will considerably intensify this man-made character, it is not at variance to it. As a result of its scale and extent, the proposed Oweninny Wind Farm will become a new, prominent feature of a landscape already influenced by human interaction. The landscape effects are considered to be High.

11.3 Conclusion

Although there have been some minor changes to the landscape and visual baseline of the study area, a review of these changes on site has indicated that they would not influence the assessment of effects on identified receptors. The exception to this is the cumulative assessment, where Cluddaun Wind Farm has been removed and Tawnanasool Wind Farm and a proposed met mast at Sheskin, east of Slieve Fyagh, have been included.

The changes to the landscape and visual and cumulative baseline would not influence the overall conclusions of the landscape and visual assessments presented in the EIS published in June 2013 and at the Oral Hearing in April 2014.

11.4 Exclusion of Phase 3

The exclusion of Phase 3 of Oweninny would result in a changed view of the wind farm layout from the viewpoints identified. The effect on the landscape of Phase 1 and 2 only and cumulatively with Corvoderry and Tawnanasool windfarms is discussed in the Assessment Report for phase 1 and 2 in Appendix 1.

12 Air & Climate

12.1 Updates Since 2013

12.1.1 Air Quality Standards

Air quality standards are constantly reviewed by the European Commission. In particular alignment of the standards for Polyaromatic Hydrocarbons (PAH), particulate matter up to 10 microns in size (PM_{10}) and particulate matter up to 2.5 microns in size ($PM_{2.5}$) with World Health Organisation (WHO) may mean stricter limits in the future. Since 2012 the European Commission (EC) has been carrying out a review on air quality policy and legislation. This review is ongoing. The 7th Environmental Action Plan of the EC has outlined the pressing need for the update of the air quality Directives, setting out clear goals for the EU by 2020. However, until such time as any new limits are introduced by the EU, the air quality assessment made in the original EIS remains as described.

The most recent EPA report published in 2014 indicates that overall, air quality in Ireland continues to be of good quality and remains the best in Europe. Measured values in Zone D for NO_2, SO_2, CO, Ozone, PM_{10}, $PM_{2.5}$. A summary of air quality parameters and air quality assessment for Zone D taken from the EPA Annual Report 2013 is provided in Table 12.1.

Table 12.1: Summary of air quality assessment in Zone D

Parameter	Lower Assessment Threshold	Limit Value	Number of national Monitoring Locations	Number of Zone D Monitoring Locations	Zone D result
NO_2 and NOx	26ug/m^3	200ug/m^3 one hour -, Calendar year 40ug/m^3	1315	43	Below the annual limit value and the lower assessment threshold
SO_2	50 ug/m^3	125 ug/m^3/d one day human beings/ / 20ug/m^3 calendar year vegetation	10	3	Below the daily limit value for human beings and vegetation and the lower assessment threshold
CO	5 mg/m^3	8 hour - 10 mg/m^3 (human beings	5	1	Below the annual limit value and the lower assessment threshold
Ozone	Daily maximum 8 hour mean - 120 ug/m^3 over 25 days per year/Long term objective 120 ug/m^3	Daily maximum 8 hour mean - 120 ug/m^3 human beings/18,000 ug/m^3/h for vegetation. Information to	12	65	Below both the annual limit value and the lower assessment threshold.

		be supplied at 180 ug/m^3			
Particulate Matter (PM_{10}, and Black Smoke)	25 ug/m^3 (one day)/20 ug/m^3 (calendar year)	One day 50 ug/m^3, Calendar year 40ug/m^3	1720	43	Below both the annual limit value and the lower assessment threshold.
Particulate Matter $PM_{2.5}$ ug/m^3	12 ug/m^3 averaged over a calendar year	25ug/m^3 average over a calendar year	7	2	Below both the annual limit value and the lower assessment threshold.

12.1.2 Atmospheric Emissions from Greenhouse Gases

Greenhouse gas emissions, as measured by the EPA, have marginally increased when compared to those levels described in the original EIS, which were based on 2011 data. According to the EPA 2013 data, Agriculture remains the single largest contributor to overall greenhouse gas emissions in Ireland, at 32.3% of the total, followed by Energy (power generation and oil refining) at 19.6% and Transport at 19.1%. The remainder is made up by Industry and Commercial at 15.4%, the Residential sector at 11.1%, and Waste at 2.5%. Overall emission levels have increased to an estimated 57.8 million tonnes carbon dioxide equivalent, which is approximately 4.5% higher than emissions in 1990.

The policy context for greenhouse gas emission reductions beyond 2020 has been changed from that described in the original EIS as a result of new national legislation and international policies around climate change.

The proposed National Climate Action and Low Carbon Bill 2015 was published in January 2015. It provides for five yearly “Mitigation Plans” to transition Ireland to a low carbon economy in line with existing EU legislation and wider commitments made under the United Nations Framework Convention on Climate Change (UNFCCC).

The EU leaders have also agreed a European 2030 policy framework in October 2014 that will see a domestic greenhouse gas reduction of at least 40% compared to the 1990 level. To achieve this, the energy sector (mainly electricity generation) will need to reduce emissions by 43% compared to 2005.

In the International sphere, UN negotiations to develop a new international climate change agreement that will cover all countries are underway. This is to be discussed and agreed at the Paris climate conference in December 2015 and subsequently implemented post 2020. At this conference all countries will propose their mission reduction targets.

The Environment Council approved the EU's intended nationally determined contribution as per the European 2030 policy framework.

The EPA greenhouse gas projections report noted that even if Ireland complies with its 2013 - 2020 obligations there will be new obligations (as yet undefined) for the years 2021 - 2030. A starting point for post - 2020 obligations in excess of the range of expected outcomes for 2020 (i.e. 9%-14% below 2005 levels) will inevitably lead to severe compliance challenges early in the following decade and beyond. In this context Ireland is not on track towards decarbonising the economy in the long term in line with the Climate Action and Low Carbon Development Bill 2015 and will face steep challenges post - 2020 unless further polices and measures are put in place over and above those envisaged between now and 2020.

It remains the case that the development of renewable wind energy, such as that at Oweninny, will significantly reduce Ireland's dependence on imported fossil fuels helping the country achieve its Kyoto and 2020 target in line with the National Renewable Energy Action Plan and reduce greenhouse gas emissions through displacement of fossil fuel energy generation.

12.2 Oral Hearing Information

The most significant information provided at the Oral hearing relates to a Life Cycle Analysis of Oweninny Windfarm and the potential impact of a release of cement dust from the proposed batching plant.

In summary, the Life Cycle Analysis for Phase 1, 2 and 3 concluded that the windfarm built on a cutaway peatland area with an operational life of 30 years achieves the following:

- The carbon footprint is: 768,064 tonnes CO_2
- The fossil carbon saved is: 14,592,605 tonnes CO_2
- The carbon emitted is: 5.26% of the carbon saved
- The carbon payback period is: 1.55 years

At the Oral Hearing National Parks and Wildlife Service raised through their submission the issue of potential impact of concrete dust on the Bellacorick Iron Flush cSAC

"The batching plant lies directly south-west of the of the Bellacorick iron flush in line with prevailing winds. This plant in operation will be using 25 tons aggregate/cement combined to produce 50mJ of concrete per day. The potential risk of cement dust being wind borne and reaching the flush cannot be ignored. Cement can be considered lethal to any ecological site and the probability of some dust reaching the flush is deemed to be extremely serious. It is strongly recommended that the batching plant be placed somewhere else off the site entirely."

Section 3.4.4 of the EIS (Emissions and emission control) recognises the potential for impacts that can arise from the operation of a concrete batching plant. The main potential for emissions from the batching plant site will occur during the operational phase (of the batching plant) and will be very intermittent in nature. For example, for turbine foundation pour the batching plant would produce concrete on 30 days, 31 days and 51 days during each of the indicative development phases.

The EIS does acknowledge that with respect to dust emissions, these can arise from materials delivery and fugitive emissions from silos, conveyor belt system and batching plant operation.

The most effective means of reducing dust emissions at batching plants is to hard-surface roadways and any other areas where there is a regular movement of vehicles. The batching plant area itself within the site will consist of a concrete apron which will be cleaned on a regular basis to remove any spilled materials.

Suppression of dust emissions from unsealed yards and roadways, will be achieved by hard coring the stockpile areas and access tracks to these and regular light watering when required

Dust emissions due to vehicles will be minimised by provision of a hard surfaced access road within the batching plant site to the batching plant area.

Wheelwash facilities will be provided at the Oweninny site main exits.

The batching plant site will be operated in accordance with best practice with good maintenance practices, including regular sweeping to prevent dust build-up.

As stated in the EIS Section 3.4.4 to ensure that dust emissions are minimised the following additional actions will be implemented:

- Aggregate material will be delivered in a damp condition, and water sprays will be applied to reduce dust emissions. Given the distance of the batching plant site to the nearest occupied dwelling it is proposed to store aggregate on hard core rather than in contained areas.
- Aggregate will be stored on site in stockpiles.
- The conveyor will be designed and constructed to prevent fugitive dust emissions. This may include covering the conveyor with a roof, installing side protection barriers and equipping the conveyor with spill trays, which direct material to a collection point. Belt cleaning devices at the conveyor head may also be used to reduce spillage.
- Before loading into a concrete truck, materials will either be premixed in a totally enclosed concrete mixer or if the batching plant is the dry mixer type loaded into trucks for subsequent mixing.
- The mixer loading area will be enclosed and water sprays and a robust curtain of suitable design or an effective air extraction and filtration system will be installed to suppress dust generated during mixer truck loading.

- Concrete trucks will be loaded in a way that minimises airborne dust emissions
- Weigh bins and hoppers will be enclosed.
- Any raw material spills will be removed promptly by dry sweeping. Water will not be used in the process of cleaning up spills except where the area drains to a wastewater collection point where washing down would be preferable to generating dust by sweeping. Where dry materials are recovered they will be recycled into the concrete batching process.
- Cement storage silos will have an approved fabric filter incorporating a fabric-cleaning device installed on each cement storage silo. The fabric filters will be serviced and maintained in accordance with the manufacturer's recommendations. Regular inspection and maintenance will be undertaken.
- To prevent overfill and subsequent filter damage, storage silos should be fitted with high-level audible and visual alarms in addition to an automatic delivery shut-down.
- If visible emissions are observed their source will be identified and corrective action taken immediately.
- All filter systems will be inspected on a daily basis to identify when cleaning/replacement is necessary. The inspection will include for checks for tears or leaks in fabric/cartridge filter systems.

The batching plant will be operated to the highest standards and will include automatic control systems to ensure that no system failures would occur during cement loading from cement tankers to the cement silos.

Such control systems typically comprise interlocked systems linking pressure drop or particle emission from the bag filters or other containment areas to the control system that will instantaneously shut down the cement filling process in the event of a pressure drop or dust detection. These control systems typically respond in milliseconds. Hence if a rupture of the bag filter occurred the filling process would stop immediately and minimal release from the bag filter would occur.

An estimate of the impact of a cement dust release from the batching plant on the Bellacorick Iron Flush was provided at the oral hearing in the expert witness statement of Dr. Paddy Kavanagh ESBI. Farner[1] published a review of the effects of dust on vegetation. This included sensitive plant species including Sphagnum species (under less tolerant taxa of mosses, the species *Messia triquetra* and *Tomenthypnum nitens* are listed. The former is now assumed extinct at Bellacorick with the latter, being one of the current rare species). In the review paper, it is noted that the lowest rates of application of cement/lime dust deposition observed to cause an effect were 0.6 and 0.5 g /m^2/day.

The estimated dust deposition on the iron flush arising from a one second release of cement dust from the proposed batching plant is 0.014g/m^2 which is over 40 times lower than the value of 0.6 g/m^2 as identified by Farner and which is the lowest rate of deposition which can cause impact on the sensitive plant species in the iron flush.

The proposed cement batching plant is located a distance of 2.43 km from the Bellacorick Iron Flush. Filling of the cement silos from sealed cement transport vehicles is a strictly controlled operation incorporating interlocking control mechanisms to prevent cement dust release. Any drop in pressure associated with a loss of integrity of the dust control filter system will lead to an automatic shutdown in milliseconds preventing an escape of cement dust.

In the extremely rare event of an emission occurring from the batching plant the automatic system would shut down the transfer system in milliseconds.

This indicates that no significant impact on the vegetation of the iron flush will occur.

12.3 Exclusion of Phase 3

Phase 3 of the Oweninny development as currently anticipated would have a rated output of approximately 200MW and this contributes substantially to the projected carbon dioxide CO_2 emissions table in 12.2 above. The impact of developing Phase 1 and 2 only would reduce the CO_2 displacement factor and also reduce the impact of other fossil fuel related electricity generation on emissions of Sulphur

[1] Farner A. M.., , The Effects of Dust on Vegetation A Review, Environmental Pollution, 79 (1993) 63 – 75

Dioxide and NOx. However, a substantial contribution to reducing Irelands CO_2 emissions and related climate change impacts would still result.

The potential for other air quality impacts related to dust and equipment emissions would be reduced also.

The impacts of developing Phase 1 and 2 only are described in the Assessment Report for Phase 1 and 2 in Appendix 1.

13 Geology & Soils

13.1 Updates Since 2013

Changes in relation to this chapter since the preparation of the original EIS relate to the exclusion of the Phase 3 development. The geological and soils environment remains as described in the original EIS. The impact of Phase 1 and 2 only is described in the Assessment Report provided in Appendix 1.

13.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

14 Traffic & Transport

14.1 Updates Since 2013

14.1.1 Development Plan & NRA Policy

The Mayo County Development Plan 2008 - 2014 was current at the time of preparing the traffic assessment and has since been superseded by the Mayo County Development Plan 2014 - 2020. The general policies relating to roads and traffic together with the specific roads objectives have been reviewed and it is considered that in the context of the original EIS traffic section study area, the development plan is largely unchanged. Similarly insofar as it may pertain to the receiving road network, NRA policy has not changed. The adoption of the 2014 - 2020 CDP does not necessitate an update to the traffic section of the original EIS.

14.1.2 Guidance Documents

The guidance documents underpinning the EIS traffic appraisal methodology are unchanged.

14.2 Oral Hearing Information

There has been some slippage in the construction commencement time originally assumed the original EIS. Assessments in the updated EIS consider a two year slippage and therefore assume that construction will commence in 2017. The updated EIS calculations show that the time slippage has a practically imperceptible effect upon the results of the original EIS traffic assessment.

In the assessment of potential cumulative impact the updated EIS excludes the Cluddaun Wind Farm which had been assessed in the original EIS. The updated EIS cumulative impacts section nonetheless includes the potential impact arising from the proposed Corvoderry Wind Farm, Sheskin Wind Farm, Tawnanasool Wind Farm and the upgrade of 110kV overhead power lines from Bellacorick.

Except for the section relating to cumulative impacts, where various potential projects have come and gone, the updates provided in the EIS reflect those scenarios and assessment refinements outlined to An Bord Pleanála in the evidence of Paul Moran and Julian Keenan at the Oral Hearing. The conclusion of the updated report accords with that of the evidence presented and shows that based upon reasonable assumptions and industry standard methodology the impact of construction traffic on the receiving road network is likely to be significantly less than forecast under the worst case scenario presented in the original EIS. The Mayo County Council submission to ABP was based on the original worst case EIS assessment. By direct comparison it can reasonably be concluded that the traffic impact arising from the proposed development would be similar to or less than that likely to have arisen from the 180 turbine development previously granted permission by ABP in 2003.

14.3 Exclusion of Phase 3

The exclusion of Phase 3 will result in a reduction of construction traffic on the N59 road and also a reduction in the duration over which traffic impacts could potentially occur.

The impacts on traffic and transport associated with the Phase 1 and 2 only development are set out in the Assessment Report provided in Appendix 1.

15 Forestry

15.1 Updates Since 2013

Changes in relation to this chapter since the preparation of the original EIS reflect the fact that Oweninny Phase 3 is now excluded. The clearfell requirement for the Oweninny project is reduced significantly as most clearfell was associated with the development of Phase 3. The cumulative impact with other planned projects has also reduced significantly.

The assessment of impacts related to forestry for Phase 1 and Phase 2 only is provided in the Assessment Report in Appendix 1.

15.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

16 Material Assets

16.1 Updates Since 2013

There have been some changes to some of the background statistical data used in this chapter in relation to tourism.

In relation to tourism, statistics published by Fáilte Ireland quoted in Table 16.1 of the original EIS show that there has been a growth in overseas tourists visiting Ireland with over 7.1 million visitors visiting in 2014 (the latest available statistics). This growth in consistent with what was described in the original EIS and does not change the potential impacts as described in the original EIS.

16.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

16.3 Exclusion of Phase 3

The contribution to renewable energy supply from the development of Phase 1 and 2 only will reduce in comparison to that of all three phases.

The impact of developing Phase 1 and 2 on material assets is discussed in the Assessment Report provided in Appendix 1.

17 Cultural Heritage

17.1 Updates Since 2013

17.1.1 Mayo County Development Plan 2014 – 2020

The Mayo County Development Plan (CDP) 2008 – 2014 was the relevant CDP in force at the time the original EIS was prepared. This was subsequently replaced when the Mayo CDP 2014 – 2020 was adopted by MCC in April 2014, during the Oral Hearing.

A review of Section 4 of the CDP – Environment, Heritage and Amenity Strategy – indicates that no changes have been made from the previous County Development Plan (2008-2014) to policies or objectives with respect to Archaeological or Architectural Heritage. In addition, a review of the Record of Protected Structures (RPS) – Volume 4 indicates that no changes to such have been made in the new Development Plan and, consequently, there are no Protected Structures located within, or in the general environs of, the subject development lands.

17.1.2 National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) was updated in late 2013 and now covers the whole county. The NIAH identified two structures of Architectural Heritage Interest located outside the subject development boundaries but within the defined study area associated with the preparation of the Cultural Heritage Chapter. These are:

1. Bellacorick Bridge – NIAH Ref: 31302702
2. Ballymonelly Catholic Church of Our Lady – NIAH Ref: 31302701

Both of these structures were identified as being of Architectural Heritage Interest in the original EIS – SITES CH-19 and CH-21.

17.1.3 Archaeological Sites and Monuments Record

The Sites and Monuments Record (SMR) is constantly updated by the Archaeological Survey of Ireland, as new archaeological sites and features are discovery by fieldwork and excavation. A review of the SMR indicates that no new archaeological monuments have been identified within, or in the general area of, the subject development lands since 2013.

17.2 Oral Hearing Information

Submissions to An Bord Pleanála by the Department of Arts, Heritage and the Gaeltacht and Mayo County Council with respect to Cultural Heritage, particularly Archaeological Heritage, are broadly in line with the mitigation strategy suggested

in the EIS, particularly with respect to Archaeological Heritage. Responses to these submissions were made at the Oral Hearing.

The submission by the Department of Arts, Heritage and the Gaeltacht, included a number of concerns with respect to Archaeological Heritage were largely predicated on the concept of micro-siting, which is not proposed. In summary, all the development areas, as proposed in the application, have been subjected to archaeological surface reconnaissance surveys, during which nothing of archaeological potential was noted. Consequently, there are no specific development areas where in-situ preservation or pre-development intrusive archaeological investigations are required. In the event that previously unknown/unrecorded features of archaeological interest potential are uncovered during the course of the monitoring of development works, then the advice of the National Monuments Service, Dept. of Arts, Heritage and the Gaeltacht will be sought and implemented, in conjunction with the Bord na Mona Project Archaeologist. Such implementation measures will include methodologies for preservation in situ and/or investigation procedures and timescales to be agreed with the National Monuments Service.

17.3 Exclusion of Phase 3

As the overall footprint of the development will reduce with the exclusion of Phase 3, the potential to impact on previously undiscovered or undocumented archaeology will also reduce. The impact of developing Phase 1 and 2 only is described in the assessment Report in Appendix 1.

17.4 Conclusion

Updates to the Mayo County Development Plan and the National Inventory of Architectural Heritage do not materially change the baseline data included Chapter 17 of the EIS.

It is considered that there is sufficient information in the EIS to enable a consideration of likely effects on the Cultural Heritage resource. No impacts on known cultural heritage sites, monuments or structures will occur as a result of the development, either phased or as otherwise proposed, and the suggested cultural heritage mitigation strategies and their effective implementation will ensure that no significant adverse effects or residual impacts will occur to the cultural heritage resource.

18 Hydrology and Hydrogeology Iron Flush Area

18.1 Updates Since 2013

As part of the EIS for the proposed Oweninny Wind Farm Hydro Environmental Services (HES) undertook a detailed hydrogeological investigation of the Bellacorick Iron Flush (SAC) which exists within the Phase 1 area of the wind farm site. A wider scale study of flush areas in the vicinity of the Oweninny Wind Farm site was also undertaken. This includes the Formolyle Flush (within the Bellacorick Bog Complex SAC) and a poor flush and petrifying spring that exist on the eastern section of the wind farm site (Phase 3 area).

No additional work or monitoring has been undertaken. There is no requirement to make updates to the previously submitted chapter.

18.2 Oral Hearing Information

Additional site investigation data in relation to the impact assessment for the Bellacorick Iron Flush SAC was presented at the Oral Hearing.

The key findings in relation to potential impacts of the proposed borrow pit are as follows:

- the groundwater flow direction in the area of the borrow pit area is in a south-westerly direction towards the Sruffaunnamuingabatia Stream and away from the iron flush and its recharge area;
- the presence of sand and gavels to the southwest of the borrow pit area along with the hydraulic gradient means the preferential path for groundwater flow will be towards the Sruffaunnamuingabatia Stream and not towards the iron flush;
- there is no potential for groundwater flow from the borrow pit area directly towards the iron flush (i.e. in a northwest direction). This conceptual groundwater flowpath as suggested in the Department's submission is not physically possible as the proven groundwater gradient will not permit it;
- there are no significant variations in the permeability (i.e. low permeability) of the glacial deposits to the west of the borrow pit that would force groundwater towards the iron flush;
- the groundwater gradient on the elevated ridge to the north/northwest of the borrow pit area is in a southerly direction towards the borrow pit. Groundwater from the borrow pit area cannot physically flow to the flush or its recharge area by means of the elevated ridge even if continuous lenses of sand and gravel were present; and,
- the additional data further substantiates the conceptual model that the elevated ground just to the east of the flush is a source of shallow (younger) groundwater recharge to the flush.

The key findings in relation to potential impacts of the closest turbines to the iron flush are as follows:

- In summary, the construction of the five turbines closest to Bellacorick iron flush (i.e. proposed turbines T13, T14, T24, T29 and T30) will have no impact on its hydrology because:
    - Turbines T13, T24 and T29 are located significantly down-gradient of the flush and its recharge area, and are also located to the west of the Sruffaunnamuingabatia Stream which is a significant hydrological boundary between these turbines and the iron flush;
    - Turbines 14 and 30 are not hydrologically connected to the iron flush or its recharge and, therefore, their presence cannot alter groundwater flows or water levels within the iron flush area; and,
    - the use of piled foundations will ensure that dewatering of deep excavations will be avoided, thereby removing the potential for alteration of groundwater levels away from the excavation area towards the iron flush.

For the reasons set out above, there is no scientific rationale to support the recommendation to remove turbines T13, T14, T24, T29 and T30.

Additional site investigation data in relation to the impact assessment for the Formoyle Flush (i.e. within the Bellacorick Bog Complex SAC) was presented at the Oral Hearing.

The key findings to demonstrate that there can be no adverse effects on the integrity of the cSAC as a result of the proposed development are as follows:

- the proposed development area is not located in the same surface water sub-catchment as the Formoyle flush. The proposed turbine locations drain to the Fiddaunfura Stream and not the Formoyle flush area;
- the proposed development area is not located in the groundwater catchment to the Formoyle flush. Groundwater in the area of the turbine locations discharge to the Fiddaunfura Stream and not the Formoyle flush area. A revised groundwater catchment map for the seepages on the western edge of the Formoyle flush is presented as Figure 18. This figure provides an update to Figure 18.18 of the EIS;
- the proposed wind farm drainage control measures (which includes buffered release of surface water runoff from hardstanding areas onto the natural ground surface) will mean that there will be no net loss of potential groundwater recharge within any surface water catchment as result of the wind farm development;
- the turbines are set back more than 0.82km (i.e. T78) from the Formoyle flush area with the furthest turbine being 1.93km (i.e. T75), and,
- there is no potential for either direct or indirect impacts on the Formoyle flush from the wind farm development.

18.3 Exclusion of Phase 3

The main potential for impact on the Bellacorick Iron Flush SAC is associated with the development of Phases 1 and 2. Hence, excluding Phase 3 will not influence the assessment of potential for impact on this iron flush area. No potential impact would be possible on the Formoyle flush or petrifying springs from the development of Phases 1 and 2 only. The assessment of this is provided in Appendix 1.

19 Hydrology

19.1 Updates Since 2013

Changes in relation to this chapter since the preparation of the original EIS reflect the exclusion of Oweninny Phase 3 from the assessment.

19.2 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.

19.3 Exclusion of Phase 3

The exclusion of Phase 3 would result in no potential for hydrological or sediment related impacts on rivers and streams draining into the Deel/Moy and Clonaghmore catchments in the eastern part of the Oweninny site.

The impacts from developing Phase 1 and 2 only are described in the Assessment Report in Appendix 1.

20 Indirect and Interaction of Impacts

20.1 Updates Since 2013

There have been no significant changes in relation to this chapter since the preparation of the original EIS. The type of indirect effects and interactions remain as described in the original EIS.

The impacts as described in this section relate to Oweninny Windfarm only.

The changed cumulative impacts arising from the refusal of the windfarm on lands at Cluddaun, which are adjacent to the proposed Oweninny Windfarm and the current planning appeal for the windfarm on lands at Tawnanasool, as well as all the other projects described in section 1.1 are considered in the Cumulative Impact Assessment Chapter in Appendix 1 Assessment Report for Phases 1 and 2.

20.2 Potential to connect to Grid West

The EIS for Oweninny Wind Farm as originally applied for indicated that Phase 3 of the development is proposed to connect to the national grid via a connection point on the Grid West Project. This was stated in the Environmental Impact Statement in the Non-Technical Summary as follows:

"*The project has Grid Connection Offers from EirGrid for 371 megawatts. Of this, 172 megawatts of the project has been assigned to connection capacity of the existing 110 kV Grid at Bellacorick Substation. This connection capacity is scheduled to be available at the end of 2015. The remaining capacity is not scheduled to be available until after EirGrid carries out further works to provide network capacity in the area*."

It was further stated at the public information meeting at Crossmolina which was summarised in Section 1.7.1 of the EIS as follows:

"*Grid Connection Issues: Some people queried the likely grid connection routes for connection to the national electricity grid. It was indicated that EirGrid had allocated 172 megawatts of the project which would be connected at Bellacorick existing substation utilising the existing 100 kV overhead lines, which would be upgraded. (Re-strung with new conductor). The remaining portion of the wind farm would be connected when the proposed EirGrid 400 kV Grid West was constructed. The exact location of the required new 400 kV substation, to which the balance of the wind farm would be connected, and transmission system route was not known at this time as it is the sole responsibility of the grid provider, EirGrid. EirGrid is in the early stages of site and route selection.*"

Subsequent to the lodgement of the planning application for the Oweninny Wind Farm development, the oral hearing, and the High Court decision in O'Grianna and Others vs An Bord Pleanála, An Bord Pleanála issued a Request for Further Information (RFI) seeking information on and assessment of the proposed grid connection for Phase 3 to the Grid West Project.

As of October 2015, the location of the connection point for Phase 3 has not yet been determined.

The Project Team did consider both overhead and underground cable routes from Phase 3 of the Oweninny Wind Farm to the 6 no. substation sites under consideration currently for the Grid West Project. However in the absence of certainty as to the preferred site location it has not been possible to carry out such assessment other than at a very high level.

In terms of an overhead line, the potential to connect Oweninny Phase 3 via an 110kV circuit, (which would require steel towers and wooden pole sets and three phases of conductor) was explored. Six overhead line route corridor options and some variants of these were identified as potential grid connection route corridors to Grid West. Export from Substation 3 within the wind farm site would require an initial 110kV underground cable to the Oweninny site boundary area, a cable interface mast and subsequently an 110kV overhead line.

In terms of an underground cable route, the potential to connect Oweninny Phase 3 via an undergrounded 110kV circuit was explored. Three main route options with 16 route corridor variants of these were identified as potentially feasible routes to connect to Grid West.

Permission for Phase 3 of the Oweninny Wind Farm is no longer sought as at this point in time the connection point for Phase 3 is not yet determined. Permission for Phases 1 and 2 is sought, in relation to which no such issue with assessment of grid connection arises.

Once the point of connection for Phase 3 to the national grid has been confirmed, it will then be possible for the Oweninny Phase 3 grid connection to be fully and completely assessed in accordance with the Environmental Impact Assessment Directive.

20.3 Oral Hearing Information

No supplementary information or significant clarifications were provided at the Oral Hearing in relation to the project implementation.