An Bord Pleanála

Inspector's Report

ABP-317560-23

Development	Proposed windfarm development including 13 no. wind turbines in Bunnyconnellan, Co. Mayo and hydrogen plant in Castleconnor, Co. Sligo.
Location	Carrowleagh, Bunnyconnellan, Co. Mayo and Curraun, Castleconnor, Co. Sligo.
Planning Authority	1. Mayo County Council 2. Sligo County Council
Applicant(s)	Mercury Renewables (Carrowleagh) Limited
Type of Application	Section 37E
Observer(s)	1. Aileen Bourke (new) 2. Aileen Ní Dhuinneachair (I nGaeilge) 3. Aileen Donagher (Mayo Sligo Energy Concern Group) 4. Aine McCann 5. Anthony Kilcullen

6. Bartholomew and Jackie Morrisroe
7. Bernard Hallinan
8. Brendan Kilcullen
9. Brendan and Helen Routledge
10. Brid Nic Gabhann (I nGaeilge)
11. Coillte
12. Damien Ruane
13. Danny and Sandra Beardshall
14. Deirdre and John Burke
15. Edel Gallagher
16. Edward Farrell (Moy Valley Protection Group, Kilfian Moygownagh Community and Landscape Protection Group)
17. Francis Kavanagh
18. Grace Dempsey
19. Honcharenko Mariya
20. Janice and Wes Moran
21. Jennifer Harrison
22. Joe Melvin
23. John Bourke
24. John Dooley &Val Martin
25. Joseph Queenan
26. Judd Ruane
27. Kieran Cummins (Eco Advocacy)
28. Kevin and Kelly Bourke
29. Leo Mulrooney
30. Leona Mulrooney
31. Liam Scott

32. Marcelle Dempsey
33. Michael Browne
34. Michael Carrabine
35. Michael Ormsby
36. Niall Fox
37. Noel and Lisa Ruane
38. Oliver Carney
39. Patrick Donegan
40. Peter Carney
41. Ronan Carrabine
42. Sarah Murphy
43. Shane Hallinan
44. Susan Donegan
45. Theresa and Padraic Morrell
46. Tom Tuffy (new)
47. Val O' Gorman

Prescribed Bodies

Mayo County Council

Sligo County Council

Department of Defence

Health and Safety Authority

Inland Fisheries Ireland

Irish Aviation Authority

Minister for Housing, Local Government and Heritage

Transport Infrastructure Ireland

Date of Site Inspection	7th and 8th February, 2024
Date of Oral Hearing	20th and 21st March, 2024
Inspector	Mary Mac Mahon

Contents

1.0 **Introduction**

1.1. This is a Section 37E application to An Bord Pleanála for a private development of a wind farm of 13 no. wind turbines, generating up to 78MW of power, 110kV substation, underground grid connection and a hydrogen plant (which would generate 80MW of power) with an underground interconnector from the wind farm substation to the substation in the hydrogen plant. The site straddles both Mayo and Sligo County Council administrative areas, in a rural location near to Ballina.

1.2. The application is accompanied by an EIAR and NIS. The associated website is the www.firloughwindfarmplanning.com.

1.3. The proposed hydrogen plant is subject to a number of other codes, including that the proposed activities are subject to an Industrial Emissions Licence from the EPA. The production of hydrogen requires abstraction from groundwater, in excess of 25m^3. The EPA shall assess if the abstraction is subject to licence. Also, the plant would be subject to COMAH, as regulated by the HSA. A connection agreement exists between the applicant and Eirgrid for 75MW.

1.4. A planning permission of 10 years duration is sought. The proposed wind farm is to have a 40 year operational life and permanent permission for the hydrogen plant.

1.5. Both planning authorities and six other prescribed bodies have commented on the application. There are 47 observers, following two periods of statutory consultation. An oral hearing was held in the course of the application.

1.6. Planning permission was granted by An Bord Pleanála at the wind farm location under **PL16.241592** for 21 wind turbines with a tip height of 120m on 01.08.2013, which would have generated 48MW of power. This permission has expired.

2.0 Site Location and Description

2.1. Overview

2.1.1. The site is located in the northwest of Ireland, on the border of Mayo and Sligo County Councils, in the Ox Mountains, close to the N59. Ballina is the nearest town. The area has ten wind farms with 65 turbines within 20km of the site. The Carrowleagh Wind Farm is adjacent to the site to the east. Please refer to the drawings submitted at oral hearing, which demonstrate the placement of the proposed development in relation to the existing turbines (6a-b 6129-ABP OH-001). These turbines are 99.5m to blade tip.

2.1.2. The site consists of two parcels of land, as well as the linear routes for the grid connection and interconnector. The proposed wind farm is located in Mayo, near the county boundary with Sligo. It consists of approximately 445 ha of cutover blanket bog. This bog has over 620 individual turbary plots and is still harvested. The levels of the wind farm turbines foundations are cited from 120m.O.D to 160m.O.D.

2.1.3. The proposed hydrogen plant is located in Sligo, on 6.5ha of agricultural land set back from the N59, in the townland of Carraun. It is approximately 5.5km northeast of Ballina.

2.1.4. The underground grid connection is 6.65km from the proposed substation to the Gleenree-Moy overhead line.

2.1.5. The interconnector underground cable route connects the substation to the hydrogen plant substation and 8.2 km in length.

2.2. Wind Farm Location

2.2.1. The wind farm location is circa 4km northeast of Bunniconlon, 6.5km south of Corbally and 7.5km of Culleens. Enniscrone is 11km to north and Ballina is 12km to the southwest.

2.2.2. Housing is relatively distant. The nearest dwelling is 725m from Turbine 3 (T3), which comes within 4 times the tip height of the turbine (740m). The owner is stated to be involved in the project.

2.2.3. There is a court-tomb located within the wind farm location and another adjacent to it, to the west. The second court tomb is surrounded by forestry. Please refer to Figure

14.8 of the EIAR for the accurate location of the tombs, as the former is incorrectly identified on the O.S. map.

2.2.4. The Euro Velo 1 ‘Atlantic Coast Route’, an international cycling route, passes the wind farm location on the L5137-9. There are way-marked regional walking routes which meet at ‘the Windy Gap’ some 4 km from the site. These routes are the Western Way, the Foxford Way and the Sligo Way. There are a number of loop walks centred around Ballyconnellan.

2.2.5. The wind farm is circa 100m from the Ox Mountains SAC (site code: 0002006) and Ox Mountains NHA. Surface waters from the east of the wind farm are headwaters that flow through the SAC and onto the River Easkey, a salmonid river with Freshwater Pearl Mussel. Downstream, surface water from the west of the wind farm flow to the River Moy SAC (site code:002298). This SAC flows into the Killala Bay / Moy Estuary SAC and SPA, respectively (site codes: 000458 and 004036).

2.3. Underground Grid Connection

2.3.1. The proposed 110kV underground grid connection is to run from the wind farm substation to the Gleenree-Moy kV Overhead Line (OHL). It is 6.6 km in length. After leaving the wind farm, the cable is located within the public road for circa 6km, before entering an agricultural field and connecting to the OHL. While on the public road, the cable will cross underneath the Loughnagore Stream, the Glenree River, the Fiddaun Stream, and the Srafaungal River, by way of Horizontal Directional Drill (HDD).

2.4. Hydrogen Plant Location

2.4.1. The location of the Hydrogen plant is circa 6.5km from the wind farm location. It is setback from the N59 and is located in County Sligo, with the Dooyeaghny stream running along part of southern boundary of the site, before heading southwest. A tributary, to that stream is the South Corbally. This rises on the site’s southern boundary and continues west under the N59. There is a roadside water pump, which also connects to this stream.

2.4.2. The proposed plant sits at between 45m O.D. and 53m O.D., in a relatively secluded upland agricultural field. Access to the hydrogen plant is from an existing local road junction (L6612-1) with the N59. There is a house and sheds located here. Two sheds and part of another shed are to be demolished as part of this project. The house, which

is to be demolished and a replacement house is to be constructed slightly nearer the hydrogen plant, under a separate planning application, to follow later.

2.5. Underground Interconnector

2.5.1. This links the wind farm substation to the hydrogen substation at the hydrogen plant. It is 8.2km long, of which 6.7km is located along the public road. Some 1.05 km is on third party lands. It connects to the hydrogen plant via the L6612 and L6612-1.

2.6. Haul Routes

2.6.1. The haul route for the turbines will be either from Killybegs Port or Galway Port. Whichever route is selected will require some upgrading. The upgrades are identified in the accompanying drawings and public notice.

2.7. Road Naming

2.7.1. The L6612-1 is the junction to be upgraded at the N59 to serve the hydrogen plant and is locally known as ‘Leafy Lane’. The L6612 accesses the N59 to the north of the L6612-1.

2.8. Watercourse Naming

2.8.1. The Dooyeanghy Stream, which runs past the proposed hydrogen plant location, is spelled variously. It is also referred to as the Cloonloughan Stream. The South Corbally Stream, as per EPA maps, is a tributary. The EPA maps show the Newtown Stream as being to the north. However, the IFI refer to both the Dooyeaghny and South Corbally as the Newtown Catchment, but which does not include the Newtown Stream.

3.0 Proposed Development

3.1. Turbines and Associated Works

3.1.1. 13 no. turbines, each capable of generating 5-6MW of power, with a tip height of 179 or 185m are proposed. The turbines will have a rotor diameter of 149m or 155m and a hub height of 102.5m or 110.5m. Turbine bases will be 22m or 25.5m in diameter. Existing access tracks will be upgraded, construction of new access track, turbine foundations and crane hard standings. A new site entrance from the L5137-9 local road will be provided. Underground electrical and communications cabling will be installed.

3.1.2. A 110kV substation will be constructed near the entrance to the wind farm. This will require forestry felling (2.92ha). Two control buildings will be constructed of 213.5 m^2 and 437.46 m^2 in area. Wastewater will be retained in a sealed storage tank and tinkered offsite.

3.1.3. A site drainage network including sediment controls will be installed. A temporary site construction compound and construction materials compound will be provided.

3.2. Grid Connection

3.2.1. An underground grid connection cable of 6.7km will be laid to connect to the existing Carrowleagh-Kilbride 110kV overhead line, which lies to the south of the wind farm. The cable will be laid in the public road for most of its length.

3.2.2. Two end angle masts will be required to connect the cable to the overhead line (Towers 15A and 15B). These will be 16 metres in height and will be located northeast of Bunnyconnellan.

3.2.3. Four watercourse crossings will be required for the route, over the Brusna, Glenree and Behy rivers. These will be completed by Horizontal Directional Drilling.

3.3. Hydrogen Plant

3.3.1. The hydrogen plant is located some 600 metres east from the N59. A new junction has been designed, with an access road and upgrades to the L6612-1 junction with the N59.

3.3.2. The hydrogen plant includes an electrolyser building (130m x 110m x 16 m), substation, water treatment building, two control buildings, underground storage tanks,

dispensers and associated works. Two boreholes to abstract groundwater are proposed to supply the plant, which will abstract a maximum of up to 99,000 m^3/year. However, this amount includes for a 50% safety factor. It is anticipated that the bulk of the water supply will come from harvested rainfall. A connection to the public water supply is proposed, for contingency purposes.

3.3.3. A temporary construction compound will be required. During construction, wastewater will be retained in sealed storage tank and tankered offsite. During operation, a septic tank and constructed wetlands will treat wastewater.

3.3.4. When operating, groundwater is treated to ensure that all impurities are removed. This will be done by Reverse Osmosis and Continuous Electro De-ionization. The wastewater will be treated through constructed wetlands and the discharge rate to the Dooyeaghny Stream will be regulated by the EPA. Flow will be limited in periods of low flow on the Dooyeaghny Stream.

3.3.5. The purified water will then be passed through the electrolyser that will split the water into hydrogen and oxygen. The oxygen will be vented to air and the hydrogen will be dispensed to tube trailers. A maximum of 52 tube trailers movements will occur per day. A process diagram is included in the photographs accompanying this report.

3.3.6. The maximum amount of hydrogen to be stored on site will be 40,128 tonnes and manufacture of hydrogen will cease should this level of storage be reached. It will commence again once hydrogen has been moved off-site. This is in line with the level of a Lower Tier COMAH site, which has been confirmed by the HSA. An Upper Tier COMAH Site would be in excess of 50,000 tonnes.

3.3.7. Please see the additional drawings submitted at the Oral Hearing for more details in relation to drainage and levels.

3.4. Interconnector

3.4.1. A 110kV underground cable will connect the wind farm substation to the hydrogen plant substation. The interconnector route will require six crossings of watercourses of the Brusna River.

3.5. Haul Routes

3.5.1. The turbines will be brought to Killybegs or Galway and transported along the N56, before joining the N15 and onto the N59. The route will then leave the N59 onto the

Stokane Road. It will pass a school and continue on to the wind farm location. A one-way system will be in place and construction traffic will leave via Corbally on the N59.

3.5.2. Upgrade works to the public road will be necessary at 8 locations. These will be improved or temporarily modified to provide for the haul route for the turbines. Details can be found on Page 3 of Chapter 2 of the EIAR and associated drawings. The local roads include the L-5137-9, L5137-0, as shown on Drawing 6129-PL-258 and L6612 as shown on Drawing 6129-PL-257

3.5.3. The demolition of one agricultural shed and part demolition of another (circa 118m^2) is required on the L6612-1 to construct the upgraded road and roundabout.

3.6. Duration

3.6.1. Planning permission is sought for 10 years with an operational life of 40 years for the wind farm from commissioning. A permanent permission is sought for the hydrogen plant.

3.6.2. The construction phase is anticipated to take 21 months, over a 5 day, 12 hour day from 0700 to 1900 and limited working hours at weekends.

3.7. Project for EIA Purposes

3.7.1. Chapter 2 of the EIAR refers to the project for EIA purposes, which include the demolition of a dwelling, 2 no. sheds and part demolition of a third at the entrance to the site for the hydrogen plant at the N59. It also includes construction of a new house and shed to replace these, south of their existing location. However, planning permission is not being sought for these elements as part of this application.

3.8. Project Rationale

3.8.1. Capacity for grid connection in North Mayo and Sligo is limited. The hydrogen plant will allow the excess electricity generated by the wind farm to be utilised to generate hydrogen, which can be transported by tube trailers to the market.

3.8.2. The modular electrolyser system will be installed in 5MW batches. The first 10MW will produce 4,000kg of green hydrogen, which will be transported by 11 no. tube trailers. An 80MW electrolyser will produce 31,200kg of green hydrogen, which can be transported by 26 no. tube trailers.

3.9. Habitat Restoration

3.9.1. A Biodiversity Enhancement and Management Plan (BEMP) has been submitted for the restoration and rehabilitation of an area of cutover bog 10.6 ha. However, it was not referred to in the public notice, nor included in the blue line, indicating control of this area. This was rectified at Oral Hearing stage and the amendment was advertised.

4.0 Planning History

4.1. On Site

4.1.1. **PL16.241592 (11/495)**

4.1.2. Permission granted by Mayo County Council and upheld by the Board on 01.08.2013 for a Wind farm of 21 wind turbines, each turbine with a hub height of 85m and rotor blades of 35.5m in length with a total power output capacity of 48.3MW. The development will also include the upgrading of c. 9.9km of existing site tracks and the construction of c. 350m of new site tracks, hard standing areas, electrical control building, compound, erection of 2 no. anemometry masts and installation of underground cabling. In addition, the development will include the carrying out of temporary site works and ancillary works to serve the developments. The permission was for 10 years duration and expired during this application process.

4.1.3. **22/221**

4.1.4. Permission granted by Mayo County Council on 11.05.2022 for retention of a temporary meteorological mast (80m in height) and associated site works that will operate for a further 2 years.

4.2. Relevant permissions

4.2.1. **North Connacht 110 kV Project ABP313724-22**

4.2.2. This line is to run from Moy, west of Ballina to Tonroe in Roscommon. The application was granted planning permission on 13.09.2023. The planning report states that the level of renewable generation in the area is far greater that the current carrying capacity and some circuits or station equipment are overloaded. This includes the Glenree - Moy 110kV. The North Connacht 110 kV project will cater for additional renewable energy.

4.3. 22/502

4.3.1. Mayo County Council granted for Constant Energy in Croghaun West, Bellacorrick, Co. Mayo for green hydrogen production plant.

4.4. **2137**

4.4.1. Sligo County Council - Permission granted for a dwelling house on 01.04.2021 at Carraun for Stephen Donegan and Leona Mulrooney. The water supply is stated to be from the public mains.

4.5. **20297**

4.5.1. Sligo County Council – permission granted for a dwelling house on 20.12.2020 at Carraun for Patrick Donegan.

4.5.2. **15136**

4.5.3. Sligo County Council – permission granted for a dwelling house on 11.06.2015 at Carraun for Noel Ruane and Lisa McKinley.

4.6. **06/3861**

4.6.1. Mayo County Council – permission for 13 no. wind turbines, 64 m hub height and 71 m rotor diameter (99.5m to tip height), 20 kV substation granted 12/10/2007 at Carrowleagh, Bunnyconnellan, Co. Mayo. This is the adjoining wind farm. Details of this vis-à-vis the application were provided at Oral Hearing stage.

5.0 Policy Context

5.1. Administrative Areas and Status of Development Plans

5.1.1. The hydrogen plant, its road access, the turbine delivery route and the interconnector between the wind farm and the hydrogen plant are largely within the administrative area of Sligo County Council. The *Sligo County Development Plan* 2017-2023 was extended until July, 2024. This date has now passed. The status of development plan policy for Sligo County Council may be regarded as the last expressed policy of the Elected Members. The draft development has completed consultation of the proposed amendment stage, on 05.07.2024. It is anticipated that the CEO Report will go to councillors in September to be adopted. The plan could be in effect by October. The Board is recommended to confirm the status of the draft plan at time of decision. The proposed development is not located in an area where a land use zoning applies.

5.1.2. The wind farm location and grid connection are within the administrative area of Mayo County Council and the relevant plan is the *Mayo County Development Plan 2022-2028.*

5.2. Sligo County Development Plan 2017-2023

5.2.1. P-RDD-1 – to facilitate rural resource based enterprise, including energy production, subject to normal planning considerations.

5.2.2. P-PPAS-1 – to ensure that development does not have a significant adverse effect on protected species.

5.2.3. Riparian zones for smaller channels to have a minimum 10 metre zone on each side and 25 metres for each side of salmonoid rivers.

5.2.4. P-NR-1 – to protect the carrying capacity of national roads, by avoid the creation of new access points or the generation of increased traffic from existing accesses on the N59, outside the 50 kph speed limit.

5.2.5. The N59 from Ballysadare to Mayo County boundary is identified for ongoing improvements.

5.2.6. P-WW-5 - the development of Onsite Wastewater Treatment System for small businesses may be considered when they are in single ownership and comply with the

EPA *Wastewater Treatment Systems for Small Communities, Business, Leisure Centres and Hotels,* 1999.

5.2.7. P-SWD-8 – to encourage that runoff from permitted development is restricted or equal to the natural runoff from the undeveloped site.

5.2.8. P-WQ- Prohibit development that is likely to lead to the deterioration of water quality.

5.2.9. P-MAD-2 – ensure that appropriate distances are maintained between establishments and residential and other, sensitive areas.

5.2.10. P-CAM-4 – facilitate and assist Sligo's transition to a low-carbon economy and society.

5.2.11. SP-EN-2 – facilitate the sustainable production of energy from renewable sources, energy conversion and capture at appropriate locations and subject to compliance with the Habitats Directive.

5.2.12. A sight distance of 215 metres is required on roads with 100 kph speed limits, available from a height of 1.05 metres.

5.3. Draft Sligo County Development Plan 2024-2030

5.3.1. Relevant policies, which include for material amendments, are set out below.

5.3.2. P-EN-1 Support the sustainable development of energy generation, transmission, storage and distribution infrastructure, to ensure security of energy supply, and provide for future needs as well as protection of amenities.

5.3.3. P-WS-6 water abstraction proposals shall be subject to appropriate environment assessment and demonstrate compliance with the Habitats Directive and the Water Framework Directive.

5.3.4. PA-79 states that new development should contribute to the enhancement and restoration of biodiversity to demonstrate a biodiversity net gain. PA-80 states that this applies to sites of 0.5 ha and over (P-BD-7).

5.3.5. PA-81 refers to the strong presumption of against new lighting in naturally dark areas with a commitment to preserve and protect existing dark sky areas.

5.3.6. PA-150 refers to P-EN-2, which is to facilitate the production of energy from renewable sources and secure the maximum potential from wind energy resources.

5.3.7. PA-154 refers to P-EN-7 which is to facilitate proposals, including green hydrogen gas storage, subject to assessment. PA-155 refers to P-EN-8, which supports proposals for hybrid energy systems (later referred to as two or more renewable energy sources which improve system efficiency and balance in energy supply. PA-156 adds a section on energy storage, including green hydrogen storage and other technologies that are necessary for the smoothing out of natural variability that occurs with renewable energy. Green hydrogen offers potential for large scale storage.

5.3.8. 31.3 notes that there are opportunities for green hydrogen.

5.3.9. P-WQ-2 states that developments must demonstrate that the proposed development would not adversely affect the ability of any water body to meet its objectives under the Water Framework Directive.P-WQ-4 prohibits any development that would lead to the deterioration of water quality.

5.4. **Mayo County Development Plan 2022-2028**

Landscape

5.4.1. The wind farm location is at Area H: East Mayo Uplands. It notes the prominent ridge line of the Ox Mountains and recommends the development does not interrupt the integrity of the primary ridgelines. The Ox Mountains are considered vulnerable skylines and ridges. Development must be shown as not impinging on the character of these areas.

5.4.2. The R294 is a scenic route from west of Bonniconlan to the boundary with Sligo County Council. The policy is that there is to be no obstruction or degradation of views towards visually vulnerable features nor significant alterations to the character of sensitive areas.

5.4.3. The site is located in Policy 3 area (Uplands, Moors, Heath or Bog). Policy 15 in the Landscape Appraisal of County Mayo is to facilitate wind energy structures, where adverse visual impacts can be avoided. Policy 22 is to continue to permit development that can utilised existing infrastructure, while taking account of absorption opportunities provided by the landscape and prevailing vegetation. In Policy Area 3, wind farms have a high potential to create adverse impacts on existing landscape.

5.4.4. NEP 14 – to protect, enhance and contribute to the physical, visual and scenic character of Mayo and preserve its unique landscape character.

Peatlands

5.4.5. NEP 9 – to enhance the county's natural heritage and biodiversity by supporting the protection of and restoration of peatlands, in order to transition to a low-carbon and circular economy.

5.4.6. NEP 10 – To ensure the role of peatlands as carbons sinks and ensure that they are conserved for the ecological, climate regulation, archaeological, cultural and educational significance.

5.4.7. NEO-18 – A Peatland Management Strategy will be developed and implemented to identify damaged peatlands and those at risk of climate change and becoming carbon emitters and to conserve peatlands, to preserve habitat and ecosystems, managing flood risk and other environmental benefits.

Water Quality

5.4.8. NEO 39 – to manage the existing groundwater sources and aquifers consist with the sustainable management of these resources.

5.4.9. NEO 42 – to protect and restore water bodies with or to 'high ecological status' and maintain at 'Good Status.

Renewable Energy

5.4.10. The *Renewable Energy Strategy for County Mayo 2011-2022* forms an appendix of the current county development plant. Priority Areas are areas where permission has already been granted for wind farm development. Tier 1 Preferred (Large Wind Farms) are areas where the potential of for such development is the greatest.

Green Economy Objectives

5.4.11. EDO 66 – to support and facilitate the green economy in Mayo.

5.4.12. EDO 69 – to support and facilitate renewable energy initiatives that facilitate a low carbon transition.

Major Accidents and Seveso Sites

5.4.13. There are three Seveso Sites in the Ballina area – European Refreshments, Vermillion Exploration and Production Ireland and Brookland Gas Company.

5.4.14. EDO 70 – to ensure appropriate distances are maintained to existing and proposed Seveso sites.

5.4.15. EDO 71 – that new establishments take into account the need to prevent major accidents and safeguard the public and the environment.

5.4.16. *Tourism*

5.4.17. TRP 11 – to promote Mayo as a premier walking and cycling destination.

5.4.18. TRO 4 – to investigate the development of bike trails in Bonniconlan Bike Trail.

5.4.19. The N59 is part of the proposed County Greenway Network.

Archaeology

5.4.20. BEO 4 – to ensure that development in the vicinity of a Recorded Monument is sited and designed in a sensitive manner, avoiding adverse effects on landscape setting and context.

Natural Environment

5.4.21. NEP 1 – to support the protection, conservation and enhancement of the natural heritage and biodiversity and protect the integrity of European sites and other designated sites.

Climate

5.4.22. REP 1 – to support Ireland's renewable energy commitments and facilitate renewable energy sources at suitable locations in the county.

5.4.23. REP 5 – to promote the use of efficient energy storage systems and infrastructure, subject to proper planning considerations.

5.4.24. REP 7 – to promote the harnessing of wind energy, including new, emerging by-product markets.

5.4.25. REO 6 – to ensure that renewable energy proposals comply with the Mayo County Council Renewable Energy Strategy 2011-2022 or as updated.

5.4.26. REO 23 – to support the achievement of 600 MW of renewable energy for Mayo over the life of the plan.

5.5. European Policy

5.5.1. *The Directive on the Promotion of the Use of Energy from Renewable Sources (Directive EU 2023/2413) (REDIII)*

5.5.2. The Directive came into force on 20.11.2023. Ireland has yet to transpose this amendment directive, at the time of writing this report. It had 18 months to do this, with some provisions having a shorter deadline of July, 2024. The Directive has significant implications for the provision of renewable energy from wind, in that individual applications will not need an EIA if located in areas where there is a presumption in favour of wind farms where a national plan has been subject to SEA and AA. Furthermore, these projects will be deemed to be of Overriding Public Interest. It is acknowledged that birds and other protected species may be killed or disturbed by the operation of these wind farm. The Directive requires that the transport sector use an element of renewable energy for fuel that has a non-biological target. 29% of transport by 2030 must come from renewable sources.

REPowerEU Plan 2022

5.5.3. This plan was prepared in response to the Russian invasion of Ukraine. It's aim is to end the EU's dependence on Russian fossil fuels and to tackle climate crisis. Recovery and Resilience Facility is central to this plan. It includes the accelerated rollout of renewable energy. It requires that 45% of energy is from renewable sources. It notes that lengthy, complex administrative procedures are a key barrier to investment in renewable energy and its infrastructure.

European Green Deal 2020

5.5.4. The aim of this policy is to make Europe climate neutral by 2050. The European Climate Law made greenhouse gas emission targets a legal obligation. These were increased from 40% to 55% by 2030, in 2021.

Hydrogen Strategy for a Climate Neutral Europe 2020

5.5.5. Green hydrogen is essential to reach carbon neutrality. It is necessary for storage, batteries and transport, for seasonal variations and connecting production locations to demand centres. It can replace fossil fuels in carbon intensive industrial processes and in the hard to abate transport sections. 6 GW of renewable hydrogen electrolysis is expected by 2024 and 40 GW by 2030.

Other Relevant EU Directives

Directive 2012/18/EU (Seveso III)

5.5.6. The directive is administered by the HSA in Ireland. The production of between 5 and 50 tonnes of hydrogen is classified as a Lower Tier COMAH site.

ATEX 2014/34/EU

5.5.7. This advises on the relevant equipment within an environment of explosive atmospheres. It is administered under SI No. 230 of 2017.

ATEX 1999/92/EU

5.5.8. This advises on the health and safety of workers within an environment of explosive atmospheres. It is administered the Part 8 of the 2007 Safety Health and Welfare at Work Regulations.

5.6. National Policy

***Climate Action and Low Carbon (Amendment) Act,* 2021, and *Climate Action Plan* 2024**

5.6.1. Section 15 of the Act concerns the duties of certain bodies, to carry out their functions consistent with National Climate Objectives. It has introduced annual Climate Action Plans.

5.6.2. In Climate Action Plan 2024, renewable energy is to provide 80% of electricity demand by 2030. By this date, 50% of transport fuel is to come from non-fossil fuel sources. Hydrogen is envisaged to be used in Zero Emission Vehicles.

5.6.3. The plan seeks to achieve hydrogen uptake and scale electrolyser capacity. A Key Performance indicator for 2030 is the production of green hydrogen from renewable energy surplus generation. From 2030 onwards, the production of 2GW of green hydrogen sourced from offshore wind. Green hydrogen is to be deployed in industry, particularly where high temperature heating is required.

Renewable Transport Fuel Policy 2023-2025

5.6.4. Public transport is to examine the potential of green hydrogen for train and bus services.

National Hydrogen Strategy, 2023

5.6.5. The strategy sets out how the industry could develop and a series of actions, or road map, in relation to the development of hydrogen production and uses.

5.6.6. An indigenous hydrogen sector is necessary in Ireland to achieve decarbonisation, energy security and develop industrial opportunities. It can be derived from renewable energy ('green energy') and can substitute for fossil fuels when electrification is not feasible or cost effective. Substitution is the primary driver for hydrogen production. It is considered suitable to support the development of large scale, seasonable storage application or the seasonality of demand. It can replace fossil fuels as a backup for renewables. It will facilitate energy security, as recognised in the *National Energy Security Framework* 2022. Ireland could export its supply, enabling economies of scale needed to reduce production costs.

5.6.7. The strategy considers how to begin and scale up hydrogen production; identify end-users; transport and store the fuel and relevant infrastructure; regulate the industry and encourage growth and innovation.

5.6.8. It anticipates that approximately 2GW of offshore wind, for the production of renewable hydrogen will be required. Heavy duty transport users are likely to be the first users. By 2050, if maritime and aviation uses this fuel demand could rise from 4.6 to 74.6 TWh. Vehicle transportation is expected to be used initially, before the introduction of hydrogen to pipelines. There are existing safety regulations in place.

5.6.9. The report states that there are several gaps in regulations, licencing and permitting across the entire hydrogen value change and a full review is required to identify and fill the gaps. This statement appears to relate to the transportation of hydrogen via pipeline and the geological storage of hydrogen.

5.6.10. Production is initially to come from curtailed grid electricity from onshore renewables, with offshore post 2033. Storage will be carried out at a small scale initially. Large energy users on gas and heavy land transport are expected to the first users.

5.6.11. The report notes that the EU anticipates that 14% of energy consumption in the EU by 2050 could come from hydrogen. This is low in comparison to the UK, which envisages 20-35% and 50%, in the case of Netherlands. Ireland is expected to become a significant exporter of hydrogen.

5.6.12. Ireland's energy imports have increased recently, adding to our energy vulnerability, with 71% of energy imported.

5.6.13. In relation to technology, equipment providers are offering products in the 100MW scale.

5.6.14. The scale of water required to produce 2GW of hydrogen is equivalent to less than 1% of Ireland's current water supply. Other sources include rainwater, aquifers, streams and desalination of sea water. Each electrolysis project will be required to comply with the Water Framework Directive.

5.6.15. The provisional agreement on the Renewable Energy Directive is a target of 1% of Irish transport energy from renewable hydrogen or an advance biofuel with 5.5% by 2030. Hydrogen refuelling stations will be required by 2030, as part of the TEN-T network (Trans-European transport network) by 2030. Hydrogen is also used in some Sustainable Aviation Fuels. Shipping will also need to develop hydrogen derived fuels.

5.6.16. The report states that the CRU is responsible for the safety of blends of hydrogen gas in the pipeline system, but not for pure hydrogen, as it's not currently part of the remit of CRU. The HSA is responsible for worker's safety and the control of major accident hazards involving dangerous substances, including hydrogen. It also is responsible for regulating the transport of dangerous substances by road. However, it is not responsible when the amount of hydrogen stored is less than 5 tonnes. Hydrogen refuelling stations are likely to come under this threshold. This gap needs to be addressed. The report states that there is no specific occupational and health and safety European or national legislation for hydrogen safety (page 68) and a working group should be set up, which will be consistent with European standards in the Hydrogen and Decarbonised Gas Market package.

5.6.17. Hydrogen leakage may interact with other gases in the atmosphere and act as an indirect greenhouse gas. Standards are being set on a European level to mitigate this risk.

Guidance on technical land-use planning advice for planning authorities and COMAH establishment operators 2023

5.6.18. The HSA has published advice for proposed new COMAH establishments. It includes guidance on hydrogen gas installations. Technical Land Use Planning (TLUP) is the

advice given by the HSA to planning authorities. The guidance sets out the modelling parameters to be used, including the temperature at which dangerous substances are released, wind speed and direction, proportion of people indoors and outdoors and fatality thresholds, arising from thermal radiation, overpressure and toxicity.

5.6.19. Risk contours map the probability, that a fatality would occur to a person permanently present at a location. The inner zone represents 1 chance per 100,000; the middle zone, 1 chance per million and the outer zone (1 chance per 10 million) of a fatality. The location of the development is also considered, to assess the volume and vulnerability of persons using the space. Level 1 is a workplace or car park. Level 2 is an area in use by the general public. Level 3 is a development for use by vulnerable people and Level 4 is a very large or sensitive development. Societal risk (where there is a risk of a multiple fatalities) is thus taken into account when there is already a significant off-site population or there are a number of establishments in an area. A consultation zone within which the HSA are consulted on planning applications is identified.

5.6.20. The guidelines includes for a Major Accident to the Environment (MATTE) which considers both damage from accidents and damage from natural disasters to the environment and for the protection of waters. Natural disasters include flooding, storm damage and subsidence. Best practical means are adopted to prevent contamination. The specific risks to the local environment are considered on the basis of the Source-Pathway-Receptor model.

5.6.21. The HSA make a recommendation to advise against, or not advise against a particular type of project. The main question for the HSA is whether appropriate distances are maintained between a proposed establishment and residential development, buildings and areas of public use, major transport routes, recreational area and areas of particular sensitivity.

5.6.22. In relation to hydrogen installations, the guidance states that hydrogen is normally stored in cylinders or tube trailers, at pressures between 350 and 700 bar. It can ignite easily. The vapour cloud explosion is of particular focus, as it is more prevalent in hydrogen than in conventional fuel releases. Equipment failure frequencies is to be used to consider the risk. Various scenarios are to be modelled, from instantaneous failure to 10 mm pipe leak over 10 minutes, both indoors and outdoors.

5.6.23. The risk associated with road transport is also considered.

National Energy Security Framework, 2022

5.6.24. This prioritises the development of a hydrogen strategy, to diversify away from fossil fuels, due to the risk to security of supply. National targets for hydrogen should be and hydrogen technologies developed.

Policy Statement on Security of Electricity Supply, 2021

5.6.25. This states that the Programme for Government requires a 51% reduction in greenhouse gas emissions by 2030 and that 80% of electricity consumption will come from renewable sources by 2030. Ensuring energy security is a national priority, as the electricity system decarbonises towards net zero emissions.

National Climate and Energy Plan 2021-2030 (NCEP)

5.6.26. Ireland's target to reduce greenhouse gas emissions increased from 40% to 55% by 2030. It refers to reach 70% of energy from renewables by 2030, underpinned by the Renewable Energy Support Scheme. Energy security is a key priority.

The National Development Plan 2021-2030

5.6.27. This refers to an 80% target for renewable sources.

National Planning Framework 2018-2040 (NPF)

5.6.28. National Strategic Outcome (NSO) 8 is to transition Ireland to a low carbon and climate resilient society. NSO 9 is the sustainable management of water. National Policy Objective (NPO) 21 is to enhance the competitiveness of rural areas by supporting new sectors and services, including those addressing climate change and sustainability. NPO 54 seeks to reduce our carbon footprint by integrating climate action into the planning systems. NPO 55 promotes the use of renewable energy.

5.6.29. Ireland's national energy policy is based upon sustainability, security of supply and competitiveness.

5.6.30. The *National Planning Framework* is subject to review at present, which will in part, focus on climate change.

5.6.31. ***Spatial Planning and National Roads -Guidelines for Planning Authorities (2012)***

5.6.32. The guidelines consider that in the context of national roads, in relation to HGVs, to be strategic traffic that contributes to socio-economic development, the transportation of goods and products, especially traffic to/from the main ports and airports, both freight and passenger related.

5.6.33. There is a general presumption against the generation of increased traffic from existing access onto national roads where speeds greater than 60 kph apply. The document recognises that development of national and regional significance which by their nature are most appropriately located outside urban areas and where the locations are particularly suitable for the developments proposed.

Wind Energy Development Guidelines, 2006

5.6.34. This is the current guidelines in place for wind energy. It advices on technology, development plan policy, planning applications and EIA, environmental implications, siting and design of wind farms and planning conditions. This includes for noise management, shadow flicker, etc.

5.6.35. At 7.17, the development potential of adjoining sites should be considered and respected. A general distance from adjoining site boundaries of not less than two rotor blades should be allowed for, save with the written agreement of the adjoining landowner(s).

Draft Revised Wind Energy Development Guidelines, 2019

5.6.36. The draft guidelines provide for lower noise levels, eliminates shadow flicker and recommend a visual amenity set back of 4 times the turbine height (with a minimum of distance of 500 metres).

5.6.37. It repeats the advice of the 2006 guidelines, that a distance from adjoining site boundaries of not less than two rotor blades should be maintained, having regard to the wind resource at the site, save for the written agreement of landowners.

Regional Policy

5.6.38. The RSES for the Northern and Western Region, 2020 applies. It is supportive of renewable energy. RPO 4.18 supports the development of renewable energy supplies to maximise their value and support indigenous industry and create jobs.

6.0 Third Party Observations

6.1. Two periods of statutory consultation were undertaken as part of the application and two rebuttals of the applicant's response to submissions by observers. An oral hearing was requested by most observers (as well as Sligo County Council). Following the Oral Hearing, the application was re-advertised. To enable the Board view how the issues developed, the report will deal with the submissions chronologically.

6.2. A solar development was cited on a number of occasions. For clarity, there is no solar development proposed in this application. On one observation, there are 785 names attached. However, the inclusion of some names was challenged later.

Principle of Development

6.2.1. The area is in agricultural use and the hydrogen plant is an industrial use. This is not appropriate in planning terms nor suitable in an area which is quiet and peaceful.

6.2.2. The project is premature if there is inadequate transmission capacity in the system. There is no significant hydrogen market at present, with current usage being only 2,000 tonnes.

National Policy

6.2.3. National policy on hydrogen strategy is inadequate. The *National Hydrogen Strategy* 2023 does not envisage this type of location for hydrogen production.

6.2.4. No SEA has been carried out for hydrogen installations and it would be premature to grant planning permission in the absence of either a national plan or ministerial guidelines. European court decisions has struck down decisions made in relation to planning permission based on policies that have not been subject to SEA.

6.2.5. The wind energy guidelines are out of date and the application should be held until new guidelines are introduced.

6.2.6. Appropriate set back distances to boundaries have not been maintained with neighbouring properties, as per the *Wind Energy Development Guidelines* 2006, which expect developers to maintain a distance of at least two rotor blades (meaning two rotor diameters, as per Circular Letter PD 6/06) from adjoining properties, unless otherwise agreed in writing. This would mean a distance of 298m from Coillte property

boundary. Instead, four turbines are within 155m and 226m from the boundary (T3, T4, T5 and T6).

Local Policy

6.2.7. There is no reference to hydrogen in the current *Sligo County Development Plan*.

Safety of the Hydrogen Plant and Wind Farm

6.2.8. There are no specific occupational health and safety standards for hydrogen safety, according to the *National Hydrogen Strategy* 2023. This should be undertaken at national level before permission is granted. The EU *Hydrogen and Decarbonised Gas Package* has not been adopted by Ireland. There are no safety regulations for the production of hydrogen.

6.2.9. The safety of residents is paramount and the procedures, should an explosion arise, are not clear. It is too close to residential areas. The local fire service is not capable of dealing with such a large scale disaster in the event of an accident. The transport of hydrogen of concern, with a tube trailer leaving the site every fifteen minutes. This number of trailers could double in the future when the plant is operating at peak capacity with 80MW electrolyser, producing 31.2 tonnes daily.

6.2.10. The Preliminary Hazard Log does not consider hydrogen gas as the main possible and likely source of ignition. The specific risks and hazards in hydrogen gas production, storage, transfer and transportation have not been addressed. No relevant ISO standards have been referred to. The blast radius is very conservative. If the maximum storage was to explode, the blast radius would be 1,125m.

6.2.11. Over time, there is a risk of hydrogen embrittlement and Hydrogen Induced Cracking due to the corrosive nature of water electrolysis.

6.2.12. The chemicals in the cooling system should be clarified.

6.2.13. No fire safety certificate has been submitted.

6.2.14. Wind turbines can go on fire. It is inappropriate that H3 should be allowed to set their own setback distance.

6.2.15. The nearest acute hospital is 55km from the site.

6.2.16. No account has been taken of persons working on the land around the hydrogen plant, not within the control of the applicant. Neighbouring land is located within the inner risk zone of the hydrogen plant.

Storage on Site

6.2.17. The level of gas storage on site is unclear – is 26 tube trailers, with a capacity of 31,200kg or 50,000 kg?

6.2.18. How much processed water will be stored on site and where?

Scale of the Project

6.2.19. The scale of the project is very significant and it is not community based. The cumulative impact of other wind farms in the area have not been considered.

6.2.20. Claims in relation to capacity are made about output, which are rarely achieved. There is no track record in the building of hydrogen plants, either in this country or by the applicant.

Climate Change

6.2.21. A hydrogen leak could affect climate change. The carbon footprint of the proposed development should be considered. The tables are not considered to offer adequate information on the level of aggregates uses.

6.2.22. Information should be sought as to whether SF6 gas is being used in the project. This is a greenhouse gas, sulphur hexafluoride, which is far more potent than CO2, and the intention of the EU is to ban it from electrical equipment from 2031 onwards.

6.2.23. Wind is an undependable source of power. It is not available on demand and so capacity is limited to typically 33% of the time. Deepbore Geothermal energy is a more reliable form of energy, which is less invasive. it is less visually obtrusive, constant, no impact on property prices, no health issues and widely available. The use of fossil fuel when wind is not available should be included in the analysis of climate change.

6.2.24. Loss of carbon sink in the peat in the bog means that this is an inappropriate use of lands.

6.2.25. The use of aggregates for wind turbine foundation and service roads is an inappropriate use for a finite resource. The full extent of all materials should be

analysed for the sustainability of their processing. Various articles are cited. Fuel deliveries should be included.

6.2.26. The human rights for those working in mines in other countries should be considered.

6.2.27. Alternative sources of energy should be considered.

Abstraction of Water

6.2.28. The abstraction of water from groundwater is significant and will impact on protected habitats, aquatic life and birds. The quantities are unclear (various quantities are stated, up to 70 million litres per year).

6.2.29. Such a large level of abstraction could effect local wells in the vicinity. The local group water scheme could be affected. Agriculture and forestry could be impacted. Properties could subside.

6.2.30. What impact would there be on Freshwater Pearl Mussel, which is located in the Easkey River, which the project is connected to? What studies on ecology have been carried out for birds and bats? River quality in the Moy and its catchment will be affected. Could seawater enter the groundwater aquifer and contaminate it? How much water is in the aquifer?

Surface Water

6.2.31. There is no capacity in the Dooyeaghny Stream or in the peatland around the hydrogen site to retain excess water from areas of hard standing around the hydrogen plant, which may be polluted.

6.2.32. The potential for spills into surface water would impact on downstream environments and give rise to pollution. The use of Potassium Hydroxide is toxic to aquatic life. There is no reference to sea trout and salmon in the Brosna in the documents submitted and the Moy is the is one the most important spawning sites in Ireland.

6.2.33. The Minerex Report submitted recognises the adverse impact that contaminants released due to environmental incidences could infiltrate soils and subsoils, reaching groundwater and effect it's quality.

6.2.34. The adequacy of the treatment of the discharge prior to entry to the Dooyeanghy River system is questioned.

6.2.35. The Board is requested to ask the applicant to provide a complete breakdown of heavy metals and rare earth metals being used in the project and whether these would contribute to runoff. Such contaminated runoff could affect habitats or human health.

6.2.36. Killala Bay / Moy Estuary is a Transitional Water Body At Risk.

6.2.37. No Surface Water attenuation is proposed and no figures are provided for greenfield runoff. Increased runoff rates can lead to scouring and erosion. It is recommended that IH124 method is used rather than rainfall intensity multiplied area to calculate this. The downstream capacity and constraints should be built into the model. Only then can an appropriate finished floor level be determined for the hydrogen plant, including freeboard.

6.2.38. No map has been supplied of the surface water catchment area relative to the discharge point.

6.2.39. The dry water flows have not been presented. Information has not been provided of stream flows following a long period of dry weather, to validate the Q95% flows in discharge calculations.

6.2.40. No drawings have been provided for the Integrated Constructed Wetlands. The retention time does not factor in storage for rainfall. The composition of the final discharge, including domestic effluent, does not appear to have been incorporated in the assimilative calculation. A maximum discharge rate has not been set and this is necessary for the discharge licence.

6.2.41. The assimilative capacity assessment of the stream has not been thoroughly explored, is lacking in detail and would indicate that the stream is too small to safely assimilate the discharge. No other discharge would be possible, due to lack of head room. A representative baseline for surface water quality in the stream has not been established and it would appear that the ammonia concentrations in the wind farm area have already been exceeded. The BOD of 5 mg/l exceeds the threshold of 2.6mg/l in the Surface Water Regulations for 95%ile flow in a river waterbody of Good Status. No information is provided on nitrates, ammonia, orthophosphate and suspended solids.

6.2.42. Essentially, key pieces of information are lacking in the application in relation to groundwater abstraction, rainwater harvesting, source water storage, process source

water treatment, welfare foul sewage, constructed wetlands, discharge points and environmental monitoring.

Groundwater

6.2.43. Persons in ill-health are reliant on private wells for water that could be depleted for the proposed development.

6.2.44. The EIAR notes that overpumping of the well could reduce groundwater to below seasonal fluctuations. The groundwater vulnerability is high in this area.

6.2.45. Changes in the groundwater regime could adversely affect the Narrow-mouthed Whorl snail, which relies on a consistent hydrological and hydrochemical environment. The proposed hydrogen plant is located in an area of High Vulnerability of groundwater, some 3.5km uphill from the SAC, with a difference in elevation of 35 metres. The subsoil is limestone till. The EIAR recognises that there could be a potentially profound adverse effect if a significant amount of hydrocarbons or other metals stored on site were released.

6.2.46. The proven yield of groundwater at 232 m3/day does not provide sufficient buffer in the event of climate change, drought or prolonged pumping. The groundwater resource at BH6 may not be sustainable as observation wells at BH1, BH2, BH5, BH8, BH9 and BH11 show a steady decline.

6.2.47. The quality of the ground water is variable, including elevated nutrients and faecal contamination. The quality of the treated water to be discharged would be of concern. What happens if the storage of treated water is exceeded? It is not feasible to adjust discharge rates due to changes in receiving water flows and quality.

6.2.48. The wind turbine bases, haul routes and service road may adversely affect the hydrology of the area, leading to the displacement of water.

6.2.49. Seawater should be used instead of groundwater.

Flooding

6.2.50. Concerns of flooding of the Dooyeaghny Stream. The flood risk assessment is generic and not site-specific. There is no drawing of the surface water drainage. Absence of flooding data in the area does not mean that flooding does not occur. Historical maps show that land in the vicinity is marshy. Flood storage as occurred in depressions on the site.

6.2.51. The hydrogen plant should be classified as vulnerable under the OPW flood risk guidelines.

Wastewater

6.2.52. The treatment of domestic effluent does not comply with the *EPA Code of Practice*, 2021.

Biodiversity

6.2.53. The methodology of the various bird surveys is questioned. However, it is evident that the site being used as a flight corridor and for foraging by Golden Plover, which are a red listed species. A review of the bird surveys by an independent ornithologist is requested.

6.2.54. Otter could be affected, as could the European Eel, Brown Trout and Stickle back.

6.2.55. No appropriate assessment of light pollution has been undertaken. The bat survey does not take the other wind farms into account. Loss of roosts, habitat and habitat fragmentation are serious issues. The Natterer's Bat, which is found on site, is particularly vulnerable. Nearby bridges were not checked as possible roost sites. Not every tree was checked. Similar concerns apply to the Whiskered Bats and Leisler Bats.

6.2.56. The bat survey was carried out in February 2022, which could not give an accurate picture of bat activity.

6.2.57. Large wind farms impact on birds.

Noise

6.2.58. HH19 is not on noise contour map. Other unused houses are not included and HH10 and HH13 do not exist. The base map is questionable.

6.2.59. Cases have been brought in relation to noise that have been settled out of court. Noise effects human health and some people more severely than others.

6.2.60. Planning permission granted for a dwelling which has not been considered (20297) 100 metres from the hydrogen plant. This will be affected by noise and there is no certainty, as the model of plant has not identified, as to the actual noise levels generated.

Visual Impact

6.2.61. Over proliferation of wind turbines in a single area, seriously detracts from visual amenity.

6.2.62. The Landscape Character Assessment is inadequate and the destruction of the landscape is contrary to the European Landscape Convention.

6.2.63. The photomontages are wide angle, panoramic views which flatten the turbines and make them appear less dominant than would be in reality. The turbines are proposed at 185 metres to tip height, which is significantly taller than turbines would have been initially.

6.2.64. There are no clear photomontages of the proposed hydrogen plant and none of the angle masts for connection to the overhead 110kV Line or the substations.

Impact on Tourism

6.2.65. Impact on tourism, as the N59 is part of the Wild Atlantic Way. The photomontages were taken on a hazy day and this diminishes the visual impact of the proposed development. The proposed development will impact on the three walking routes on the area.

6.2.66. The Eurovelo Route, an international cycling route passes the wind farm. It will not be operable during construction due to the level of HGVs. The N59 is not a safe alternative.

Traffic Impact

6.2.67. The N59 is a bog road, lacking in hard shoulders and regularly requiring maintenance. The level of HGV traffic that the proposed development would generate.

6.2.68. The proximity of the two junctions (L6612-1 and L6612) on the N59 is very close with two hollows where vehicles are not visible and traffic speed is increasing on the decline to Ballina. This staggered junction is not suitable for the volume of traffic proposed. Car parking arises here due to the presence of a spring well which people collect water from. The road is not safe and accidents have occurred in the vicinity of the entrance to the hydrogen plant. It is acknowledged in the RSA that HGVs will have to cross the white line to manoeuvre this junction. The RSA refers to the wrong junction.

6.2.69. Herd movements arise on a daily basis on the L6612-1. The proposed roundabout is not suitable in a rural area.

6.2.70. Incomplete assessment of the haul route through Ballisodare and stop 1 km short of Dromore Road. The replacement of a bridge in the L2604 is not in the project overview and this could affect the Freshwater Pearl Mussel and salmon spawning beds. The Fresh Water Pearl Mussel is circa 0.7km from the wind farms.

6.2.71. Traffic is underestimated – an assumption of tipper trucks carrying 12m^3 of stone but only in reality will carry 8.5m^3 to 9m^3. Therefore 5,542 no. deliveries required rather than 4,190 deliveries. How much aggregate is being imported?

Turbary Rights

6.2.72. The proposed development will interfere with turbary rights and as sunlight and wind will be blocked from drying the turf. The impact on persons harvesting the turf is unknown. What are their health and safety rights?

Peatland on the Proposed Hydrogen Site

6.2.73. Thousands of tonnes of peat will be excavated and disposed of from this wetland to facilitate the plant.

Devaluation of Property

6.2.74. Future generations will not be able to build on the land in the vicinity.

6.2.75. Depreciation of property is a reason to refuse planning permission under Schedule 4 of the Planning and Development Act, 2000, as amended. A letter from an auctioneer is provided that confirms property will be devalued.

Archaeology

6.2.76. The wind turbine shadow from T11 could fall on the Court Tomb (MA031-034), affecting it on the spring solstice. Similarly, T5 could affect the sunlight alignment in the Wedge Tomb (MA031-005) on the summer solstice. Other archaeological sites could be affected by the interconnector (MA031-023, a fort) and the mound (ASL022-026) close to the N59 where the house is to be demolished,

Employment

6.2.77. Very little employment will be generated by the proposed development.

Consultation

6.2.78. There has been no real consultation with neighbours or with the wider community, in particular, Ballina. Virtual engagement is not proper engagement.

6.2.79. Immediate neighbours to the proposed development were not directly engaged with by the applicant.

Costs Analysis

6.2.80. The Board is requested to carry out an analysis of the cost of hydrogen fuel cell technology, which require the use of precious metals, such as platinum and iridium. A similar request is made for costs of hydrogen fuel cells and the wind turbines.

Consent

6.2.81. A number of landowners refer to owning the roadbed and state that they will not consent to road improvements or the laying of cables in the road.

6.2.82. One observer has turbary rights and a spoil heap is to be located on her plot, to which she has not consented.

Unauthorised Development

6.2.83. Unauthorised activity in terms of construction of a road to the hydrogen plant, which had to be removed following action by May County Council. Was the gathering of information during Covid times illegal? Is the improvement of local road illegal without the owners consent?

EIAR Issues

6.2.84. Population of Enniscrone should have been included in the chapter on population. The absence of it gives the impression that the area is more sparsely populated rather than is the case.

6.2.85. The application should have included for the demolition of the house on site and its replacement house and shed. The EIAR is incomplete.

6.2.86. The proposed North Connacht 110kV line should be an integral part of the application and constitutes project splitting.

6.2.87. Grid connection must be considered in EIA.

6.2.88. The technology used in hydrogen plants are not developed, so it is impossible to EIA their impacts.

6.2.89. The cumulative effects of other wind farms have not been assessed.

6.2.90. Persons could be identified through the EIAR and their GDPR rights violated.

6.2.91. HH6, HH10 and HH13 are shown on the map but are not visible.

Construction Issues

6.2.92. Dust and noise during construction.

6.2.93. A property on the L6612 has been underpinned due to subsidence and a structural stability survey should be undertaken for this road to ensure that it can withstand heavy loads.

6.2.94. How will the grid connection effect mains water, also located in the road?

6.2.95. How will traffic, including public transport and emergency services be managed? Inconvenience for over two years during construction. Risk to health due to emergency services being delayed.

6.2.96. How will the Knockbrack Bridge be affected by works and that safe passage is maintained for road users?

6.2.97. Test drilling has given rise to cracks in a new developed house and given rise to significant noise disturbance.

Operation Issues

6.2.98. Contradiction in the operation hours – will tube trailers be only in 12 hour period between 0700 to 1900.

6.2.99. Light pollution during operation.

Decommissioning Issues

6.2.100. What will happen to the wind turbines and their bases upon decommissioning? Will their metals become e-waste?

Other Issues

6.2.101. Insurance costs for land owners in the vicinity of the hydrogen plant may increase.

6.2.102. It is stated that a current Director of An Bord Pleanála has worked the developer previously on a wind farm on this site and so that person and all the other directors, who have a relationship with that director, should recuse themselves from the project.

6.2.103. The proposed development is reliant on state subsidy. As the proposal is based on intermittent wind use, which is inappropriate.

6.2.104. The drive to provide for data centres has ruined rural Ireland, as it is here that wind farms are located to provide the 'green' energy for these centres.

6.2.105. The proposals are not in compliance with the machinery directive.

6.2.106. A general statement that the proposals are not in compliance with the EIA Directive, Habitats Direct and ECJ case law.

6.2.107. The removal of trees which could have been subject to forestry grants may be illegal.

7.0 Prescribed Bodies

Irish Aviation Authority

7.1.1. A preliminary screening assessment should be carried out with Ireland West Airport and conditions are recommended.

Department of Defence

7.1.2. Conditions on lighting of the turbines are recommended.

Minister for Housing, Local Government and Heritage

7.1.3. The Biodiversity and Enhancement Management Plan does not require the cessation of peat cutting within the application site. The environmental impacts of the continuation of peat cutting are not considered in the EIAR. However, this remains a consideration for the purposes of EIA determination, which the Board must consider and whether this is compatible with the peatland policies of *Mayo County Development Plan*, 2022-2028 (NEP 9; NEP 10, NEO 18 and NEO 19).

7.1.4. The peatland is not a designated habitat and is already extensively damaged, there is an opportunity for the peatland site to be managed to minimise further damage, sediment loss, reduce oxidisation of peat and begin restoration of habitats.

7.1.5. There is an indirect impact on the Court Tomb (MA031-034) within the site in terms of setting. This is considered to be Significant / Very Significant in the EIAR (Table 14.16).

7.1.6. Conditions are recommended.

Transport Infrastructure Ireland

7.1.7. The realignment of the junction of the N59 with the local road L6612-1 (as per Drawing No. 6129 PL-121) requires the submission of a Design Report. None has been submitted. This issue should be resolved in advance of the application being decided.

7.1.8. There are concerns in relation to road maintenance and road safety that also should be resolved prior to the application being decided.

7.1.9. Works to the haul route shall be subject to Road Safety Audit. No details have been provided in relation to the abnormal weight loads. A permit is required from the relevant road authorities. A full assessment of all road structures on the national road network is required and any damage arising should be repaired.

Health and Safety Authority (HSA)

7.1.10. The HSA confirms that the proposed development would constitute a new, Lower Tier COMAH establishment.

7.1.11. Further information on the Land Use Planning Quantitative Risk Assessment is required. Eight no. specific issues are raised. These relate to whether the residential population is both indoors and outdoors; weather conditions and temperatures; jet fire conditions; thermal radiation values used; the number of loading bays in operation; the LOC frequencies; overpressure values and the events which are must significant in terms of off-site risk.

Inland Fisheries Ireland

7.1.12. The proposed development crosses a number of important fisheries waters – the Brusna and its tributaries; the Glenree Rivers; the Owencam River; the Srafaungal River, the Gowlan River and the Dooyeaghny River.

7.1.13. The Brusna and its tributaries are important salmon, sea trout/brown trout spawning and nursery habitats. The catchment is under environmental pressure. Salmon stocks are below their conservation limit, as the number of adult salmon returning is not sufficient for a sustainable fishery. It is part of the River Moy SAC, which includes salmon, white clawed crayfish and lamprey as Qualifying Interests.

7.1.14. The Glenree River is at risk of not achieving high ecological status due to hydromorphology pressures, which may include sediment/siltation pollution. Planning permission should not be granted for development that might prevent or delay their ecological status from being reached.

7.1.15. The Gowlan River is an important salmon and trout spawning and nursery habitat for the Easkey River Fishery, which attracts anglers. The Easkey River is a habitat for Freshwater Pearl Mussel. This has good ecological status and must be protected.

7.1.16. The Dooyeaghny River provides important spawning and nursery habitat for trout and salmon, which support the River Moy Estuary Fishery. IFI is investing in a habitat enhancement programme to improve this habitat and protect water quality. Water quality must be protected to support the programme.

7.1.17. Further Information is requested or conditions imposed. These include a monitoring committee during construction.

7.1.18. The Assimilation Capacity calculations for the proposed hydrogen plant to discharge to the Dooyeaghny River is based only on two grab samples, which does not provide sufficient data to assess the long term, year round potential impacts. A continuous, daily, monitoring programme should be put in place. Only estimated velocity was used instead of flow monitoring. Discharge flows will have to be managed during low flow conditions. What is the potential expansion of this facility?

7.1.19. Salmon and trout become distressed when water temperature goes to 20 degrees Celsius or above. The Freshwater Fish Directive requires that water temperature does not exceed the unaffected temperature by more than 1.5 degrees Celsius. The discharge must comply with this. A copy of the discharge licence will be required.

7.1.20. The Constructed Wetlands must provide adequate treatment and capacity for wastewater produced on site and cater for extreme rainfall events. Appropriate lining, inspection chambers, and a long term maintenance programme put in place. Suitable landscaping should be provided where there is no risk of contaminated spills.

7.1.21. There is a commitment to 80% of the processed water being rainwater. This should be adhered to. Public water supply is necessary as a contingency measure. Alternative wastewater treatment and discharge options, including to the public mains, should be considered.

7.1.22. Bunds of 110% are required and all chemicals are to be stored in this area. A fire water collection system should be in place. The IFI should be a notified body in the Emergency Response Plan.

7.1.23. Land stability monitoring should be carried out during construction of the wind farm.

7.1.24. Construction related conditions, including culvert design and method statements and a directional drilling plan are recommended.

EPA

7.1.25. The proposed development may require a licence from EPA, but none has been submitted to date. If received, the EPA will assess the EIAR. The EPA will only grant a licence where it is satisfied that the activities can be effectively regulated, in line with national and EU standards and that Best Available Techniques (BAT) has been employed.

8.0 Planning Authority Reports

Sligo County Council

8.1.1. The proposed hydrogen plant, its road access, section of the interconnector route and substation is located in Sligo. Part of the turbine delivery route is located here as well.

8.1.2. The planning authority's response includes the Chief Executive Report, views of the Elected Members and 2 no. motions proposed at the meeting concerning the application. These were to agree to submit the report and request an oral hearing.

Planning Assessment

8.1.3. The necessity of renewable energy to replace fossil fuel and mitigate climate change is recognised in national, regional and local planning policy. The current county development plan is the 2017-2023 plan, which has been varied and extended. [*Inspector – note this submission was made when the plan was in date.*].

8.1.4. The *National Hydrogen Strategy* 2023 prioritises the scale up and production of renewable hydrogen, which until 2023, is likely to be produced from grid connection electrolysis sourced from surplus renewable energy. The proposed development is considered acceptable in principle and is fully supported.

8.1.5. There are local impacts on the environment, but it is considered that there are sufficient mitigation measures, as set out in the EIAR, to ameliorate these impacts to an acceptable level. There are also benefits, including economic benefits, to the proposed development.

Landscape and Visual Impacts

8.1.6. It is noted that the size and nature of the buildings are significant and not typical of a rural setting. The landscape is designated a Normal Rural Landscape in the county development plan. The N59 to the west, is designated a Scenic Route. The area is sparsely populated. It is a rolling landscape, with pasture and forestry.

8.1.7. The hydrogen plant would be briefly visible from the N59. Views are sporadic and of the higher parts of the electrolyser building. Beyond a kilometre, there would be little impact. Landscaping will mitigate this. The alterations to the junction of the N59 is a more intensive form of road infrastructure. The proposed wind farm would not result in a cumulative impact, due to the separation distance.

8.1.8. It is considered that the visual impact of the hydrogen plant is a localised impact only. There is limited information of the design of the building, materials and finishes. It is recommended that the Board consider whether the building could be improved or reduced in scale to mitigate its impact.

Access widening / improvements to the N59 and traffic movements

8.1.9. Significant consideration has been given to the turbine haul route and associated impacts in the EIAR. While some of these changes may have a visual impact on the rural nature of the road, these impacts are considered temporal and may provide long term improvements in the road network.

8.1.10. It is considered that the traffic generated by the proposed development, the tube trailers, is the main on-going impact. There is to be a maximum of 26 tube trailers (i.e. 52 total HGV movements) and 10 vehicle movements from the site, which equates to circa 6% of the capacity of the junction. The increase is considered imperceptible.

8.1.11. The Road Safety Audit does not focus on the implications of the new junction, but instead focus on the design of the roundabout access. It is unclear that the applicant has adequate control from adjoining landowners to maintain sight lines at the junction.

8.1.12. There is a general policy in **P-NR-1** of the county development plan to protect the carrying capacity of the national road network, which includes limiting increased traffic generation at existing junctions outside the 50 kph speed zone. This reflects national policy. Where development is of a regionally important strategic nature, it would necessary to have that identified in the new draft county development plan and in consultation with TII. The Board is recommended to consider this matter.

Amenity Issues

8.1.13. The proposed hydrogen plant well removed from any sensitive premises. There will be no significant noise impact from the construction of the plant. The operation of the plant will be governed by the EPA licence on noise emissions.

EIAR issues

8.1.14. Population and Human Health – Hydrogen is non-toxic and non-poisonous. The proposed development is well setback from existing properties. The proposed development will be beneficial to human health as it will replace fossil fuel.

8.1.15. Shadow flicker – only one property within 740 metres of the wind turbines. The occupier is financially involved and there is written agreement to reduce the setback.

8.1.16. Biodiversity – the hydrogen plant is located in a field with low ecological interest.

8.1.17. Ornithology – The bird surveys were undertaken in line with best practice. The loss of habitat from the wind farm would impact on red-listed species. Implementation of the BEMP would mitigate loss of habitat.

8.1.18. Hydrogen, Geology and the Water Environment – there is no residual risk of flooding at the site and a low risk to nearby receptors. The nearest well is 1.1 km from the site and used for both domestic and agricultural use. While the quantity of water required from the aquifer, the two boreholes can meet supply requirements without depleting aquifer levels or impacting on wells nearby. A peat stability assessment is provided for the wind farm.

8.1.19. Vulnerability to Major Accidents and Natural Disasters – a full risk assessment has been carried out, including the transportation of hydrogen during operation, contamination and fire/explosion during construction, operation and decommissioning. Mitigation measures are included.

Other

8.1.20. A development contribution is requested. Based on floor area, this contribution would amount to €300,360.

Conclusion

8.1.21. There are local impacts but these can be mitigated to an acceptable level. The application is focused on the wind farm aspect, but the hydrogen plants needs appropriate weight and consideration. Matters outlined above in relation to the design of the hydrogen plant and the junction of the N59 require further consideration.

Comments and Resolutions from Elected Members

8.1.22. A resolution requesting an oral hearing was passed.

8.1.23. The consultation process is considered inadequate with local residents.

8.1.24. Local roads effected by the proposed development should be improved and maintained.

8.1.25. The access to the N59 is considered unsafe given the level of traffic generated. The decision should be consistent with TII advice, including for one-off dwellings.

8.1.26. Concern about the quantity of water being used and its impact on groundwater and water supply.

8.1.27. The need to provide for green energy is acknowledged. The market for hydrogen is quested.

8.1.28. The loss of peatland in Mayo used by Sligo residents is noted.

8.2. Mayo County Council

8.2.1. The proposed wind farm, interconnector, grid connection and loop-in location are located in Mayo. While the application and submissions were circulated to the planning authority, no response was received from the council. The council declined to participate in the oral hearing. A further letter was issued to the council requesting their views on the application. The response was received from Mayo County Council on 13.03.2024. The response from the planning authority does not contain a record of the views of the elected members of the authority.

8.2.2. The response refers to relevant international energy policy, national energy and climate policy and guidance and regional policy.

8.2.3. It notes that the Renewable Energy Strategy for County Mayo, contained in the current development plan, dates back to 2011, when turbines were smaller in height and less imposing on the landscape, in comparison to modern turbines. It notes that the previously permitted turbines had an overall height of 120.5 metres and the adjoining wind farm turbines have an overall height of 99.5 metres. The proposed development will be either 177 metres or 185 metres. The current energy strategy will be reviewed, having regard to the changes in technology and potential visual impact. Therefore, the preferred locations for wind energy may change in the future.

8.2.4. The hydrogen plant is not dependent on location beside a wind farm. Once the energy used to convert water to hydrogen comes from a renewable source, that will be sufficient for certification purposes. There is little detail on end users, so it is considered that the locational need for the hydrogen plant at this location has not been fully justified. It is considered that the sustainability of the proposed development, the end user is key and therefore, alternatives have not been adequately considered.

8.2.5. The difference in height between 177 metres and 185 metres is not considered to be significant in terms of visual intrusion on the landscape.

8.2.6. There is an element of uncertainty in relation to the works required on the delivery route. Where the road carriageway is less than 4.5 metres wide, local widening with granular material is required. The location of this widening is not identified, so the localised impact on biodiversity is not clear. The ownership of the lands affected is not clear.

8.2.7. The substantial increase in turbine height, combined with the existing wind farm, is considered to have an overall negative impact on the landscape character at this location due to the disjointed visual cluster effect. Particular concern in terms of visual impact related to Viewpoint 5 at Killala Bay, Viewpoint 6 at Ballinteen, R314, Viewpoint 7 at Rosserk Friary and Viewpoint 8 at Rinroe, L2065.

8.2.8. Conditions are recommended in relation to financial contributions, including community gain and security for the reinstatement of the site.

8.2.9. While a specific roads report is not provided, general conditions are suggested.

8.2.10. The Flood Risk Section considers that to further assessment of flood risk is required.

8.2.11. No report was received from the environment section.

8.2.12. There is no objection from the Archaeology Section. Conditions are recommended.

8.2.13. The planning authority recommends that An Bord Pleanála considers the comments as set out above and recommends a series of conditions to be applied.

9.0 Applicant's First Response to Submissions

9.1. This summarised below, with repetition minimised.

Response to Sligo County Council

Policy context

9.1.1. Climate change, Regulation (EU) 2022/2577 (for the acceleration of the consent process for the deployment of renewable energy), the need for energy security and the presumption of Imperative Reasons of Overriding Public Interest for renewable projects, and the National Planning Framework (paragraph 11) provide a presumption in favour of such developments, unless material considerations indicate otherwise.

9.1.2. The proposed development is a vital transition component to decarbonise sectors that have been difficult to electrify. The First Party welcomed the support for the proposed development in principle from Sligo County Council and that the mitigation measures were considered sufficient.

Visual impact

9.1.3. The design of the hydrogen plant has been carefully considered. The siting was chosen in part due to its topography and ability to screen the plant. Landscaping will be provided and the proposed native woodland mix will screen the plant from the N59 over time.

Traffic

9.1.4. The proposed junction has been analysed in the Stage 1 Road Safety Audit, which was independently carried out and the final design has incorporated the recommendations. The junction has been designed for a 100 kph speed limit and in accordance with TII Specification DN-GEO-03036 *Geometric Design of Junctions*. The design team met with Sligo Roads Department to discuss the junction. Autotrack analysis has been undertaken. Lands for the junction realignment and visibility splays have been acquired, which deals with Sligo County Council's concern. It will also facilitate future widening of the N59. It should be noted that this is an existing junction.

Consultation

9.1.5. An oral hearing is not considered necessary as all relevant issues have been appropriately responded.

9.1.6. A Pre-Application Community Consultation (PACC) Report is included in Appendix 1.3 of the EIAR. Public Information Days were held over two days with experts on hand to answer the questions asked. The project was changed following this consultation, which included relocating the hydrogen plant, changes to the design of the wastewater treatment and monitoring.

9.1.7. The EIAR contains a 'Worst Case Scenario' and mitigation measures are designed to accommodate these.

Response to Mayo County Council's Submission

9.1.8. Please note that Mayo County Council's submission was made outside of the prescribed time limits, following a request from An Bord Pleanála. It was received on 13.03.2024, a week before the oral hearing (20th to 21st March,2024), which was not attended by the council, although invited. The applicant responded to the council in a separate document submitted at the oral hearing. I have summarised the response at this location for convenience of the Board, as I asked some questions on the issues raised by Mayo County Council at the oral hearing.

Tier 1 Areas in the Future

9.1.9. The applicant noted that the wind farm element is located in the Tier 1 zone for large scale wind farms, as set out in the 2011 strategy. This has been adopted into the current development plan (2022-2028). It is considered that a similar exercise of the sieve mapping carried out under the current strategy, will be undertaken in the future, but it is unlikely that it will result in a significant change to the areas identified as the landscape and visual factors underlying the strategy are unchanged. The broad scale and productive character of the receiving landscape, which already contains turbines, can absorb additional turbines.

9.1.10. *Absence of a locational need for the hydrogen plant, alternatives have not been adequately considered*

9.1.11. Wind energy production is being curtailed in Mayo due to the limitations on capacity in the transmission grid. The proposed development captures this 'curtailed' energy when the grid cannot utilise it. This is in accordance with EU Rules for Renewable Hydrogen Production, which must come from renewable sources. The criteria include geographical proximity to the installation producing renewable energy, so a location

need exists. It is also consistent with the *National Hydrogen Strategy* which recognises that hydrogen will initially be trucked from the point of production. It prioritises the production of hydrogen at times of curtailment to the transmission system, while wind speeds are high. This arises at the current location.

Uncertainty in relation to haul routes corridors

9.1.12. A Swept Path Analysis was performed on the routes, as set out in Appendix 15.2 of the EIAR. The third party lands are identified on the drawings submitted. There is no uncertainty for the haul route.

Visual Assessment

9.1.13. The height of the turbines is consistent with modern turbines. Sheskin and Owenniny III have blade tip heights of 200 metres. This was anticipated in the *Wind Energy Development Guidelines* of 2006, which stated that the height of turbines will change over time with technological advances in relation to height and capacity. The main change in the *Draft Wind Energy Development Guidelines* of 2019 is to ensure that turbines are set back four times the height from residential properties.

9.1.14. The impact of the change in height between the existing and the proposed is minor, due to the proposed turbines being to the fore of the existing, which is visually coherent with a distance perspective and no conflict of scale arises. From the distance, the existing wind farm is barely visible above the forest line.

9.1.15. Repowering of existing wind turbines will see smaller, older generation turbines replaced with taller models so this evolution will be visible in the landscape setting. Mayo County Council has referred to ‘disjointed visual cluster’, which is taken to mean when turbines of different height overlap in the visual envelope. This occurs only in a limited number of views in this case and significant effects do not arise.

9.1.16. The concern in relation to VP5, VP6, VP7 and V8 is overstated. In these views, the distant turbines (between 9.7 and 16.6km) break the skyline with the Ox Mountains beyond. The turbines in these views are seen legibly, with the ridgeline behind. This is simply scale and the impacts are not notably negative.

Response to Health and Safety Authority

9.1.17. The HSA was consulted with during the scoping stage of the EIAR. A Draft QRA was submitted for review. A second scoping meeting was held and the Design Team

informed of guidance for hydrogen production which was published in the revised *Technical Land Use Plan*. An updated QRA has been submitted and the overall conclusions do not change. There are minor changes on the contours.

9.1.18. The assumption on individual risk contours is 90% indoor occupancy and 10% outdoor occupancy. The wind rose data has been updated to Knock Airport and the assumption changed from 93% to 80% for wind direction D5 and from 7% to 20% for wind direction F2. The frequency of magnitude assumption for a jet fire from a 10mm leak has been corrected. This does not affect the QRA as no 'outdoor fixed installations' has been assessed. Outdoor equipment is limited to H2 storage (modelled as cylinder arrays, as per HSA guidance), road transport loading arms, road transport units and on-site pipeline. The frequency of magnitude assumption for a flash fire from a 10mm leak has been corrected. There was a typographical error in the assumptions register, but the modelling carried out reflects HSA guidance.

9.1.19. The Thermal Radiation value has been updated to provide a continuous curve. Seven loading bays have now been modelled instead of five loading bays. The Loss of Containment frequencies have been recalculated and does not change the overall conclusions. The overpressure values in Appendix D have been updated. There is a minor change in the contours.

9.1.20. A summary of events that are considered the most significant is set out. These are divided between the inner zone and the outer zone. They relate to failure of the trailer tubes in the storage area, the failure of machinery in the plant, the failure of the trailer tubes in the loading bays and the loss the entire contents.

Response to IAA

9.1.21. A scoping document was sent to Knock Airport but no response was received. The site is outside the 'Outer Horizontal Surface', over 15 km distance. The Ox Mountains are 3km west of the wind farm, and significantly higher which must be navigated. There are no potential effects on aviation and conditions for lighting of the turbines can be complied with.

Response to IFI

9.1.22. An Environmental Monitoring Committee proposal is noted.

9.1.23. Continuous monitoring of the Dooyeaghny River is not necessary prior to grant of planning permission. The EIAR has considered the 'Worst Case Scenario' and having identified this, based the mitigation measures on this. On-going monitoring will be put in place as part of a grant of permission.

9.1.24. The worst case scenario for discharge during prolonged dry weather flows and peak average wastewater, when the proposed hydrogen plant is in full operation. The plant is expected to generate the most hydrogen in February, when wind is the most plentiful. Lowest discharge will arise in summer, when winds and rain are lighter. Therefore, peak average wastewater will coincide with peak flows in the stream.

9.1.25. In a drought scenario and there is unfavourable assimilative capacity for an extended period of time, the wastewater can be stored and tankered off site to a licenced facility. The discharge can be limited to 50% in this situation and still not have a significant adverse effect downstream on surface water quality. If there is no buffer capacity, the hydrogen plant can be shut down for that period of time. The wastewater storage tank can hold between 1 and 4 months worth of wastewater (1,500m^3).

9.1.26. The monitoring of effluent quantity and quality and the assimilative river will be continuous and automated, so an emergency response is activated. The EPA will be monitoring any licence granted. There is no potential for any future expansion as the proposed hydrogen plant has been designed to its maximum capacity associated with the wind farm. A copy of the IED Licence from the EPA will be forwarded to the IFI and access to the discharge location will be provided on a 24 hour basis. The wastewater discharge will comply the Freshwater Fish Directive and will be discharged following treatment at ambient temperature. The detailed design of the treatment system, including Constructed Wetlands will provide for storm events, appropriate landscaping and rainwater harvesting.

9.1.27. Rainwater when available will be used as the main source of raw water and will be stored underground. The total gross storage capacity for harvested water is 15,058m^3. This will reduce pressure on the groundwater resource and will reduce concentrated groundwater chemistry in waste waters arising. Some 50,000m^3 of rainwater will be harvested from the roofed and non-roofed area, accounting for 80% of the annual demand for water.

9.1.28. A pre-connection inquiry has been submitted to Uisce Eireann (CDS23001225) and confirmation has been supplied that connection is feasible.

9.1.29. No impact on ground water base flows to the Dooyeaghny Stream is anticipated as the Zone of Contribution is likely to be mainly north of the site. Tributaries are outside the Zone of Contribution.

9.1.30. Most of the conditions suggested by IFI can be complied with. However, the suggested connection to the Ballina Wastewater Treatment Plant is not feasible. The wastewater generated by the hydrogen plant is effectively concentrated groundwater and it is better that it is returned to its catchment than brought to Ballina.

9.1.31. Fire waters will be contained in the hydrogen plant and will not be discharged directly to the river. The firewater will be retained in the storage facilities.

9.1.32. Land stability during the construction of the wind farm will be monitored, including for instream turbidity and the locations for monitoring agreed with the IFI.

Response to Minister of Housing, Local Government and Heritage

9.1.33. Peat cutting will cease in the footprint of development infrastructure and the habitat restoration area. The applicant has not control over the third party turbary rights in the wider wind farm area. The EIAR recognises that peat cutting will continue in assessing likely significant impacts. Where the area is in the control of the applicant, nature based solutions to surface water attenuation will be used.

9.1.34. The proposed development could reduce discharge rated below the baseline runoff rates and therefore have a beneficial impact on hydrology and mitigate against potential flooding events.

9.1.35. The proposed wind farm is located solely in areas where turf cutting has taken place and no intact bog remains. There will be no impact on the intact bog from the wind farm, but it will continue to be cut by those with turbary rights, as identified in the EIAR. The Biodiversity Enhancement Management Plan relates to 10.6 ha of blanket bog outside the development area, which has been partially cutover.

Response to Coillte

9.1.36. Coillte is reliant on the interpretation of the *Wind Energy Development Guidelines*, 2006, of two rotor blades being interpreted as two rotor diameter, as set out in the Circular 6/06 from the Department. A circular does not have the same status as

Section 28 Guidelines. The guidelines refer only to a distance of not less than two rotor blades from adjoining property and these are in the crosswind and down wind direction.

9.1.37. The language in the *Draft Wind Energy Development* Guidelines 2019 is unchanged as being two rotor blades. In this case, two rotor blades are equivalent to 155 metres and the turbines are all outside this distance to the Coillte boundary. If the distance of two diameters, then 3 wind turbines would be within 310 metres from the site boundary with the Coillte lands. The recommendation of 2 rotor blades is in excess of the UK planning guidelines of 1 rotor blade only. It should be noted that recent case law, the requirement is to have regard to ministerial guidelines, which means considering the matter, factoring in its relevance and the weight it should be given (J. Humphreys in *Cork County Council v. The Minister for Housing, Local Government and Heritage and Ors* in [2021] IEHC 683). Have regard does not mean compliance with.

9.1.38. The setback is required to preserve the development potential for wind farms on the adjoining lands. The adjoining lands are unlikely to have wind farm development potential, due to their limited size and proximity to housing (generally, a 500 metres setback distance is required, or 4 times the tip height), without the written agreement of the owner. As 185 metres is becoming the norm for tip height for turbines, this setback distance is 740 metres. The effect is to sterilise Coillte lands (see Figure 3.8 and 3.9 in the response document).

9.1.39. It should be noted that there has been a planning permission on the site from 2013. In that case, the downwind separation distance is 7 rotor diameters and the crosswind separation distance is 3 rotor diameters. The Coillte lands are upwind of the consented farm.

9.1.40. There is no opportunity for Coillte to consider the site for wind development as there is no capacity in the transmission system – hence the need for the hydrogen plant.

9.1.41. On that basis and given the pressing need for renewable energy, it would be inappropriate to give serious consideration to the Coillte submission.

Response to Transport Infrastructure Ireland

9.1.42. A design report for the N59 L6612-1 Junction has been prepared and can be submitted. It was intended to submit this at the detailed design phase.

9.1.43. A pre-construction and post-construction condition survey, including structural assessment, will be carried out for the haul route. The turbines will be transported by licenced hauliers, who will obtain the relevant permits. Reinstatement details will be agreed with the relevant planning authority.

9.1.44. There are no greenways or active travel routes affected.

Response to Department of Defence

9.1.45. The lighting conditions will be complied with.

Response to Observers

Consultation

9.1.46. Consultation was undertaken with the local community and those in the vicinity of the proposed development, as the Community Liaison Officer directly or by hand, delivered leaflets and other communication forms. In addition, two Public Information Days individual meetings, email and phone contact took place. There was a Virtual Information Days and there is a project website. A neighbourhood meeting was also organised. Consultation significantly exceeded the Aarhus Convention.

9.1.47. There are significant economic benefits, including long term income flows to landowners, an improved rate base and the economic activities associated with construction and investment. €200 million will be invested, 100-150 jobs will be created in construction and 10-20 jobs will be created at operational stage. Annual rates will be of the order of €650,000 - €780,000 for 40 years.

9.1.48. The proposed development will create a Community Benefit Fund of €500,000 per annum, for the first 15 years. Funds will be administered by an administrative committee.

9.1.49. It is noted that while some observations stated that they were not consulted with, they had in fact attended the consultation days.

Intermittent Nature of Wind Energy

9.1.50. The North Connacht 110 kV project will not be sufficient to transmit all the renewable energy that can be generated in the area. Eirgrid still expects that the constraint will be of the order of 11 to 20%. The proposed development will enable surplus wind

energy to be captured. Alternatives were considered including Battery Energy Storage Systems, Electronic Vehicle Fleet Charging and Liquid Air Storge.

9.1.51. The *Policy Statement on Geothermal Energy for a Circular Economy* 2023 states that there isn't enough knowledge on the temperature and geology of Ireland's deep subsurface currently, to compare directly with other forms of renewable energy. Under these circumstances, deepbore geothermal energy is not a reasonable alternative.

9.1.52. The application is not relevant to data centres.

9.1.53. This is an application for a project and so the SEA of wind energy plans or guidelines is not relevant. However, the project is plan led in that it complies with government and local policy on wind energy. The wind farm is located in a 'Tier 1 (preferred large wind farm)' location in the *Mayo Renewable Energy Strategy*, in a plan that has been subject to SEA.

9.1.54. There is nothing preventing a community led energy proposal from begin formulated. There is significant support for the project, as people recognise the need to displace fossil fuel urgently. This is in the interest of the common good.

Hydrogen Plant Regulations, Safety and Storage

9.1.55. Regulations are in place for the hydrogen plant, under the Seveso III Directive, the Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulation 2015. The maximum on-site storage of hydrogen is 40.128 tonnes), which constitutes a 'Lower Tier' COMAH site, being less than 50 tonnes.

9.1.56. The HSA require a Major Accident Prevention Policy (MAPP) to be submitted prior to commencement of operations. An outline has been included in Appendix 16.2 of the EIAR. An Emergency Response Plan will be generated, although not technically necessary. Other relevant documents include a Risk Management Programme, an Operation Management Plan, a Traffic Management Plan, ATEX Assessment and Safety Management System will be in place, in accordance with HSA guidance.

9.1.57. The EU ATEX Directive 2014/34/EU covers equipment and protective systems in potentially explosive atmosphere, which is implemented under SI No. 230 of 2017 of the same name. The health and safety of workers is governed by the 2007 Act.

9.1.58. Hydrogen has a proven safety record. It is not toxic and is non-poisonous. It does not create fumes that impact on the environment or endanger the health of humans or

wildlife. If leaked, it quickly dilutes into a non-flammable concentration, thus reducing the risk of ignition at ground level. It needs more oxygen to explode than gasoline. It is less likely to lead to secondary fires as the flame has a lower radiant heat than gasoline.

9.1.59. There are no buildings or occupied areas within the contours established in the Land Use Plan QRA. These contours show the distances to the lower flammability limit and upper flammability limit from flammable gas dispersion (i.e. flash fire extent), distances to specified thermal radiation levels from jet fires and distances to specified vapour cloud explosion overpressure levels. The contours include for the 1E-06 / year (one millionth) maximum tolerable risk to a member of the public and the 5E-06 / year (five millionth) maximum tolerable risk to a person at an off-site location. The nearest buildings not associated with the proposed development are circa 300 metres from the plant and the public road is circa 600 metres.

9.1.60. The societal risk is considered to be broadly acceptable at the location. Leak/fire detection systems will be in place, with isolation/automatic shut off. Building ventilation, pipe pressure flow rate monitoring, impact sensors, alums, fire protection and suppression equipment and pressure relief systems put in place. There will be 24 hour monitoring of the plant by staff.

9.1.61. While the hazard log is a preliminary one, it will be finalised with the relevant information, when the final equipment is known. There are more stages which include Front End Engineering, Hazard Identification, Hazard and Operability Analysis and ISO standards will be used once the design has been progressed to sufficient detail. The relevant ISO standard is 15916 regarding safety and focuses on prevention and mitigation. These are too detailed to consider at a preliminary stage. However, the preliminary hazard log deals with the type of hazards outline in the ISO safety standard. In turn, the assessment of the consequences is set out in the QRA.

9.1.62. The preliminary hazard log does not deal with hydrogen embrittlement, but it is a known risk. Piping failure is considered, as opposed to the reasons why the pipe fails. Material selection comes under the Front End Engineering Design and it is at this stage that how to avoid hydrogen embrittlement is assessed.

9.1.63. Sligo Fire Service were consulted with. This consultation will continue post consent.

9.1.64. In term of tanker movements, 52 movements are the maximum, at full operational capacity, assuming a capacity of circa 4,000kg of hydrogen (currently Irish tankers are 1,200 kg) at 380 bar pressure. However, it not anticipated that this will occur on a daily basis, as due to the intermittent nature of the wind and whether the electricity generated is being exported back to the grid.

9.1.65. Storage will take place in the tube trailers (33 in total (26 filled tube trailers plus 7 filled tube trailers)) plus a buffer tank capacity of 528 kg. This equates to 40.128 tonnes.

9.1.66. Due to the COMAH requirements, storage will not exceed 50 tonnes of hydrogen.

Hydrogen demand

9.1.67. Green hydrogen is currently being produced in Dublin at a BOC facility. Hydrorogen buses have been rolled out for use in Dublin and Belfast. By 2030, 14% of transport will require to be from renewable sources. Heavy duty transport, industry and flexible power generation and in time, aviation and maritime transport will require hydrogen.

Rare Earth Metals

9.1.68. Nickel anodes will be used. Nickel is not a rare earth metal, but an abundant one.

Hydrogen Efficiency

9.1.69. Hydrogen efficiency is poor in comparison to heat pumps. Hydrogen will not be used for heating purposes, but rather transport.

Cooling System

9.1.70. The cooling process is a fin fan process that uses air, not chemicals. Ethylene glycoal is used in the electrolysis process. This is a closed-loop process and does not enter the wastewater system. In the future, the warmed air may be used rather than dissipated, but the technology is not there at present.

High Voltage Underground Cabling and Electromagnetic Fields

9.1.71. The wind farm will be connected to the national grid by two 110kV underground cables to tower structures on the Moy-Glenree 110kV overhead line. A third cable will connect to the hydrogen plant. Construction will comply with the relevant ESBN and Eirgrid standards (CS-GFS-00-001-R1). A comprehensive Health and Safety Assessment will be prepared in advance of construction, so that risks are prepared for.

9.1.72. The underground cabling is considered in terms of its impact on the existing electricity network in Chapter 13 of the EIAR. Existing drawings of the network will be confirmed by CAT scan and verified. The as-built location of the ducts will be recorded before the trench is backfilled.

9.1.73. The cables will give rise to extremely low electric and magnetic fields and these will comply with international standards. The wind farm electromagnetic field (including substations) are very localised with an imperceptible long term impact.

Hydrology and Hydrogeology

Water Abstraction

9.1.74. A pumping test was carried out. Its duration was 546 hours, when the industry norm is 72 hours, to ensure confidence in the results. It was carried out at a time of lower than average rainfall and when groundwater levels were reduced. Therefore, there is confidence in the results that a sustainable yield can be achieved. The relationship between BH6 and BH7 was examined, having regard to potential interaction. A Zone of Contribution has been submitted.

9.1.75. Rainwater harvesting is the primary source (up to 80%) and contains less pollutants than groundwater. Groundwater abstraction and groundwater levels will be monitored continuously.

9.1.76. In extended drought situations, a number of mitigation measures can be used, including the temporary cessation of hydrogen production until raw water sources are replenished. However, during times of peak wind, there are high periods of rainfall, so the hydrogen plant will be in peak operation when winds and rainfall area at their highest. Two underground tanks will be used to store water, providing some 15,000m^3 of water, which can provide between one to four months of backup water supply.

9.1.77. Some 65,061m^3 of water is required annually for hydrogen production. The boreholes can sustainably supply 84,680m^3 per year. Annual average recharge is 0.2m per year. The catchment area is 325,000m^2, which increases to 488,000m^2 to allow for a factor of safety of 50%. This Zone of Contribution will come from the north of the site, consistent with the topography of the area. The rainwater contribution will significantly reduce the size of the Zone of Contribution. Groundwater abstraction will have a minimum impact on drawdown.

Impacts on Downstream Habitats

9.1.78. The sensitivity of surface and groundwater is considered in the EIAR. The surface water refence concentrations will comply with the relevant Statutory Instrument requirements. Realtime monitoring will of water use and discharge will ensure that resources are properly managed and controlled.

Impacts on soils

9.1.79. The Zone of Contribution is overlain by peatlands, which has a poor recharge rate. The peatlands are reliant on rainfall for their wetting and the sustainable use of groundwater will not affect the soil moisture.

Ground Subsidence

9.1.80. There will be no ground subsidence or soil dewatering. The boreholes will be sunk to approximately 80 metres below ground level, within bedrock. They will be cased in sleeves so the bedrock will not leach into the boreholes. The bedrock is generally limestone and shale and covered by 6 metres of overburden. The bedrock is sufficiently strong to support any changes in groundwater levels.

Wastewater Discharge

9.1.81. Without mitigation measures, there would a significant effect on surface water quality. However, mitigation measures will be in place. The wastewater will contain the original groundwater hydrochemical constituents in approximately 30% of the original volume. It requires treatment and will not be directly discharged. Equally, the receiving water needs to be continuously monitored to ensure that there is adequate assimilative capacity, as set out in Appendix 9.3 of the EIAR. The system and associated fail safes will be automatic and emergency responses built in. In addition, the plant will be subject to EPA licence.

9.1.82. Some 1,500m^3 of wastewater will be stored on site (one month's supply). Therefore, the loading of constructed wetlands can be controlled and managed. In the event of prolonged inadequate assimilative capacity, the wastewater can be tankered off to an appropriately licenced facility. In a worst case scenario, production will cease. It is more likely that the highest rate of hydrogen production will coincide with the windier and wetter times of the year (October to February).

9.1.83. The wastewater treatment proposals do not comply with the EPA *Code of Practice* as the Code relates to domestic wastewater treatment systems, with a population of less than 10 persons. Instead, the design of the waste water treatment system complies with integrated constructed wetlands.

9.1.84. Liquids will be bunded. Accidental spills and firewater are contained on site.

Assimilative Capacity of the River

9.1.85. The worst case scenario has been tested and mitigation measures put in place to deal with it, as set out above. Peak discharge will coincide with peak wet conditions, with favourable assimilative capacity. When in prolonged dry spells, the wastewater can be stored and tankered off site. In typical operating conditions, there will be no likely significant impacts on the receiving waters.

9.1.86. Monitoring will confirms the Q95%ile and Q98%ile and the treatment system calibrated to ensure that the Ecological Quality Status is not exceeded. As well as telemetry monitoring, covering water depth, turbidity, pH, temperature and electrical conductivity, field monitoring will occur monthly. This will include grab samples, hydrochemistry measurements, flow and discharge. The EPA will have oversight.

Groundwater Levels and Quality

9.1.87. Similarly, groundwater levels will be monitored continuously in the boreholes and monthly checks undertaken of hydrochemistry.

Loss of Permeable Surfaces and Impact on Hydrology

9.1.88. Mitigation measures have been proposed to deal with surface water runoff and there will be a net benefit in terms of reducing flood risk.

Flood Risk Assessment

9.1.89. The flood risk assessment has been carried out in accordance with national guidance. The site does not flood. There will be in an increase in runoff arising from rain. The risk of flooding downstream has been considered in the Stage 2 Flood Risk Assessment, which caters for the 1 in 100 year, plus Climate Change, event. SUDs features include rainwater harvesting and storage volumes. The surface water catchment and network is shown in Volume III of the EIAR.

Sea Water entering the Aquifer

9.1.90. The coast is 7.4 km from the hydrogen plant. Due to site distance and elevation, salt water incursion in the aquifer is unlikely.

Traffic and Transport

Safety of the Junction of L6612-1 and the N59

9.1.91. The junction has been designed in accordance with TII specifications and meetings have been held with Sligo County Council. The findings of the Stage 1 Road Safety Audit have been incorporated into the application drawings. An Autotrack has been carried out. There is a 215m visibility splay at a 3m setback, which is appropriate for the 100kph speed limit. The volume of traffic on this road is low (227 AADT (January 2023)). Drawing No. 6129-PL-121 shows the visibility measures. The change in terms of the volume of traffic during operation will be minimal.

9.1.92. Radii comply with standards and include junction tapers, which accommodate the swept path of HGVs. No crossing of the white line will arise as additional with has been provided on the local road. Skid resistance surfaces and appropriate signage will be provided.

9.1.93. The redundant section of the L6612-1 can be used for pedestrian purposes. The new section will have grass verges and crossing points at the roundabout junction. The existing junction has the capacity to deal with construction.

9.1.94. Concern was expressed to delays of emergency vehicles and the safety of vulnerable road users as well as access to property during construction. A Traffic Management Plan will be submitted to the two planning authorities and An Garda Siochána. Road closures will be scheduled in consultation with local residents. The Contractor will endeavour to avoid busy agriculture times, such as silage cutting.

9.1.95. Traffic will be allowed to use the passing bays on the L-6612 (landowner consents are in place). In relation to swept path analysis for the turbine delivery route, one of the main hauliers who deliver turbines, Collet and Son, have assessed the route. Swept path analysis has only been carried out where difficulties were identified. It should be noted that the N59 Killybegs Route has been used for turbine delivery previously for a number of wind farms.

9.1.96. The local bridge on the L2604 has been surveyed and the bridge parapets may require to temporarily works for the wide load (the wheelbase of the truck can cross the bridge). Any modifications will be temporary and agreed with the planning authority and the bridge will be reinstated following each delivery. A structural assessment of the bridge will be carried out to see if strengthening works are required.

9.1.97. Generally, spoil at the proposed wind farm and hydrogen plant will be reused on site.

Air and Climate

9.1.98. Dust will be managed during construction. Given the mitigation measures and the distance to neighbours, the impacts are predicted to be slight and short term. Traffic fumes will also be slight during construction.

9.1.99. During operation, there will be very little dust generated.

9.1.100. The tube trailers are anticipated to utilise hydrogen fuel, so the fumes will be water vapour and heat. If diesel trailers are necessary in the short term, there will be no significant impacts to air quality, given the number of traffic movements.

9.1.101. The hydrogen plant will generate oxygen and a licence is required from the EPA for the venting of oxygen. Oxygen is not considered a pollutant.

9.1.102. During decommissioning impacts are anticipated to be similar to construction.

9.1.103. The beneficial indirect impacts of the displacement of fossil fuels are considerable.

9.1.104. In terms of leaks from the hydrogen plant, hydrogen will not impact on Climate Change or contaminate the environment.

9.1.105. The carbon saving calculations have been prepared using the methodology employed by the Scottish Government. It includes the access tracks, concrete, peat removed from the hydrogen plant, the manufacture of turbine technology, transport, construction and tree felling. The construction, operation and changes to the peat environment have been calculated as between 6-9% of the total carbon dioxide that has been off-set by the proposed development.

Cultural Heritage

9.1.106. There is a predicted indirect long term reversible impact on the Court Tomb (MA031-034), in terms of setting. The tomb sits on an east-west alignment, with the

chamber gallery opening on the eastern side. This alignment is not unusual. There has been no scholarly evidence that the alignment has been deliberately aligned with the spring equinox date.

9.1.107. The indirect impact on the wedge tomb MA031-005 is also acknowledged. Its orientation is northeast-southwest, with the wide entrance on the southwestern side. Again, there is no recorded evidence of deliberate solar alignment. The south-west entrance would not align with the summer solstice sunrise or sunset. The archaeo-astronomical potential of wedge tombs in Ireland has been explored and no solstice link has been established.

9.1.108. There is no direct impact on the barrow site adjoining the N59 (SL022-026), which is 14 metres south of the red line boundary. However, during construction, it will be protected by a works exclusion zone. Testing and monitoring in the vicinity will be carried out to ensure that no undiscovered archaeological features would be inadvertently damaged.

9.1.109. The ring fort (MA031-023) and children's burial ground (MA0310-023001) have been examined. The ring fort circa 35 metres from the grid connection route and the children's burial ground is likely to be within the ring fort's banks. The grid connection is in the road at this point. Again, archaeological testing and monitoring will be carried out.

Ecology

Bats

9.1.110. The wind farm is located in a landscape of low bat importance. The cumulative impact of wind farms in the area has been considered in the EIAR. There are 66 turbines. All the wind farms have been assessed for environmental and ecological effects. The impacts on bats from the proposed development is not significant. The bat surveys have been carried in accordance with national and international guidance.

Birds

9.1.111. The site has been studied during ornithological surveys and it is considered that the hydrogen plant location, the grid connection route and interconnector route will not be of significant value for birds. The preliminary bat roost and badger survey also checked for ground nests during this survey. None were found.

9.1.112. The purpose of the vantage point survey is to provide baseline data for the Collision Risk Modelling. Thirty-six hours of coverage of each vantage point is required in both the summer winter periods. This is in accordance with the *Scottish Natural Heritage Guidelines*, 2017. There is no reference to spacing the survey work out over days.

9.1.113. The observation that noted the error in Appendix 7.2 regarding the absence of recording the data on 12 Golden Plover for 13.02.2020 is correct – the incorrect date was given. Golden Plover is using the wind farm site and nearby SAC, as discussed in the EIAR.

9.1.114. Transect surveys for breeding and wintering birds often follow established routes, to enable repetition at a later date, so it is not unusual to follow the bog roads. The purpose of the transect study is to identify breeding territories, rather than count nests.

9.1.115. The Grouse Survey is specific to Red Grouse and is subject to licence, using a tape lure.

Narrow-mouthed Whorl Snail (Vertigo angustior)

9.1.116. The NIS has identified the presence of the snail as a qualifying interest of the Killala Bay / Moy Estuary SAC. It is located in the marsh habitat near Killanly and is unlikely to be affected by contaminants that could potentially be carried to the estuarine waters. The EIAR and NIS include mitigation measures to prevent the release of contaminants into the waterbodies.

Otter

9.1.117. Otter could be indirectly effected by sediment loading, which would reduce the biotic diversity and food resources for fish or from toxicity and or a reduction in prey availability. Mitigation measures are proposed in the EIAR and NIS.

Freshwater Pearl Mussel (FWPM)

9.1.118. The EIAR has addressed the FWPM population in the Easkey River. Surveys of watercourses were undertaken and consultation with the NPWS and IFI. The nearest population to the proposed development is in the Gowlan River, circa 3.5 km downstream of the site. There is no FWPM in the tributary stream feeding the Gowlan River as the habitat is not suitable.

9.1.119. Sedimentation and eutrophication are the main threats to the species. The construction phase mitigation measures are outlined in the EIAR, Section 6.4.2. The use of SUDS measures will protect water quality during operation. Decommissioning measures will be similar.

Pine Martin

9.1.120. A terrestrial mammal survey was undertaken and no evidence was found of their presence, as stated in the EIAR.

Wetlands and Peatland

9.1.121. The peatland where the proposed wind farm is located in is unlikely to be functioning as a carbon sink due to the drainage system in place and removal of peat. The Biodiversity Enhancement and Management Plan (10.6ha) is for an area of cutover, lowland blanket bog, which adjoins the southwest area of the site. This will rehabilitate this part of the bog and enhance the habitat for red grouse, meadow pipit (both red listed species), skylark, the common frog and common lizard.

Use of Potassium Hydroxide

9.1.122. Both potassium hydroxide and glycol will only be used in the closed-loop electrolysis process and will not be discharged to waste water. Mitigation measures are in place for accidental leakages.

Surveying of the Dooyeaghny River

9.1.123. Electrofishing was carried out in three locations on the Owencam River, a tributary to the Glenree River and a tributary to Gowlan River. Surveys of watercourses in the site and within a potential zone of influence and for 500 metres downstream were carried out in 2021. These were done in accordance with the Environment Agency's *River Habitat Survey in Britain and Ireland Field Survey Manual*, 2003.

9.1.124. Save for the hydrogen plant, during the construction phase, a 50m setback distance of watercourses. The hydrogen plant will be 70m from the Dooyeaghny River, save for the discharge outfall.

9.1.125. During operation, wastewater from the hydrogen plant will pass through a vegetated swale prior to outfall. Mitigation measures have been provided and the proposed development will be subject to EPA licence.

Landscape and Visual and Tourism

9.1.126. The photomontage photography was undertaken over 3 days, when good weather was forecast. Viewing conditions in the Ox Mountains was less clear than coastal locations. However, they present a realistic approximation and are supported by wireframe images. Locations were chosen to reflect representative viewpoints of people living or visiting the area.

9.1.127. The photomontage of the hydrogen plant reflects the views that it would be seen from. It should be noted that the hydrogen plant is not visible in the same views as the wind farm, which is as result of physical separation distance, screening and intervening topography.

9.1.128. The photomontages are in accordance with the *Guidelines for Landscape and Visual Impact Assessment* (2013), which was jointly prepared by Irish and British landscape institutes and the Scottish Natural Heritage *Visual Representation of Wind Farms Best Practice Guidelines* 2017.

9.1.129. The loop-in masts are not included in the photomontages, but they are assessed in the LVIA.

9.1.130. There is no contravention of the *European Landscape Convention*. This convention is not intended to preserve landscapes unchanged but to protect and manage the landscape in a sustainable way.

9.1.131. In relation to tourism, during construction and decommissioning, impacts are slight, not significant and negative. During operation, a slight positive impact will arise.

Noise and vibration

9.1.132. Construction noise will be well within the recommended construction noise guidelines. Noise from construction trucks will not be excessive because of their low speed.

9.1.133. No construction activity will impact on homes near the hydrogen plant. Trucks generate vibration, but well below levels that give rise to damage to houses.

9.1.134. Construction hours will be limited to 07:0019:00, Monday to Friday and 08:00-13:00 hours Saturday with no work on Sundays or Bank Holidays.

9.1.135. During operation, while manufacture occurs on a 24 hour basis, the tube trailers will only operate from 07:00 to 19:00.

9.1.136. The site manager will deal with any noise complaints during operation. The individual brands of equipment do not need to be known in advance as the procurement of equipment will be based on the noise levels specified in the licence. The main noise generators are the compressors and there will be two on site, but which are housed. The noise impacts are well understood and will be incorporated into the design of the plant.

9.1.137. Workers within the plant will be covered by Health and Safety standards.

9.1.138. In presenting the noise findings, the assumption is on speeds off 5 metres per second and that all the equipment will be running at once, continuously.

Zoning

9.1.139. The wind farm site is located in an area, which is a preferred area for wind farms. The site is located in a 'Normal Rural Landscape'. The hydrogen plant will appear similar to a large agricultural shed. It is in a 'structurally weak area' and an 'area in need of regeneration'.

9.1.140. The draft *Sligo County Development Plan* 2024-2030 refers to the area as a 'Remote Rural Area'. It supports the implementation of the Climate Action and Low Carbon Development (Amendment) Act 2021 and Climate Action Plan 2023 and all subsequent updates.

9.1.141. The proposed development is in accordance with the zoning of both plans, which promote renewable energy, notwithstanding a specific reference to hydrogen.

9.1.142. The land for the hydrogen plant is not in productive agricultural use but is used for horse grazing.

9.1.143. A wind farm has previously been permitted at the wind farm location.

Constructed House 20297

9.1.144. This is HH6 in the EIAR. The house will not be affected by noise from the wind farm and so is not included in the noise assessment in relation to that. It is included in relation to the hydrogen plant and referenced in Para 11.27.4.6 in the EIAR, as being within 30 metres of the access road. The owner and applicant of HH6 has not made

any submissions in relation to the proposed development and is stated to be supportive of it.

Consents

9.1.145. The landowner consents are in place for the proposed development. Works to the public road will be undertaken by a statutory undertaker.

Turbary Rights

9.1.146. Works to plots outside the footprint of the wind farm site are not affected and access is maintained.

9.1.147. While the wind farm site is 445 ha, the land take for site access roads, hardstands and turbine foundation is approximately 27.55 ha, some 6% of the site. Agreements are in place with plot holders and communication channels are in place throughout the lifetime of the project. Access to plots will be managed to enable saft access through the construction and decommissioning phases. These will be timed to avoid peak peat cutting phases. During operation, outside the footprint, turbary will continue unaffected by the development.

Covid Restrictions

9.1.148. During Covid, all regulations were adhered to.

Project Splitting

9.1.149. Planning permission has not been sought for all the elements of the project, but the EIAR includes all elements. The EIAR has been prepared in accordance with the EIA Directive and the Habitats Directive.

Sustainable Development

9.1.150. The proposed development is sustainable development, bringing a positive economic impact (investing €200 million), assist in the decarbonisation of the economy (displacing between 1.6 and 2.5 million tonnes of CO2), mitigate climate change, improve air quality, enhance energy security and improve the local environment of cutover, blanket bog.

Livestock

9.1.151. There is no evidence that wind turbines impact on livestock.

Clarity on where information can be obtained

9.1.152. The EIAR provides details on the proposed development and information can be found in relation to the following matters in the relevant EIAR sections:

- Groundwater abstraction – Section 2.6.6.3
- Rain and stormwater harvesting – Section 2.6.6.3 (specific equipment at detailed design)
- Source water storage and ancillary works – Section 2.6.6.4 and Drawing No. 6129-PL-804
- Process source water treatment – Section 2.6.6.4
- Welfare foul sewage systems – Section 2.6.6.5
- Discharge points – Section 2.6.6.6
- Environmental and Processes Systems monitoring – Section 2.7.10.

9.1.153. A detailed Environmental Management Plan will be finalised and agreed with the planning authorities on appointment of the Civil Works Contractor and deal with conditions set out in any grant of permission.

SF6 Gas

9.1.154. There is none in the hydrogen plant and the two substations in the proposed development are Air Insulated Substations (not gas).

Key Metrics

9.1.155. Total volume of concrete – 13,136 cubic metres.

9.1.156. Total steel – 1,455 tonnes.

9.1.157. Imported crushed stone and rock - 50,277 cubic metres.

9.1.158. The aggregates will be sourced from four authorised quarries in the vicinity of the site.

Decommissioning

9.1.159. On decommissioning, the turbines will be dismantled and the bases will be left in-situ. The hydrogen plant will continue operations indefinitely. If it ceases production, the process equipment will be decommissioned and dismantled.

Population

9.1.160. North Enniscrone was not included in the population statistics as it is over 2 km from the red line and 5 km from the hydrogen plant.

Director of An Bord Pleanála

9.1.161. A current director of An Bord Pleanála has worked with the applicant in the past. An Bord Pleanála has governance structures to avoid conflicts of interest.

GDPR

9.1.162. The EIAR Directive requires that the impact of projects on local populations are assessed. Therefore the mapping properties and estimation of occupancy is essential to establish impacts.

Public Health and Wind Farms

9.1.163. The weight of scientific evidence is that there is no reliable evidence that wind farms directly cause human health problems. The leading body for medical research in Australia (the National Health and Medical Research Council) confirmed this specifically in terms audible noise, low frequency noise, infrasound, EMF and showflicker, in their 2015 study "*Systematic review of the human health effects of wind farms*".

Petition

9.2. The submission which includes a list of 785 names, includes some that have provided letters of support for the project (see Appendix A). Some letters have included a request for an oral hearing in the same hand writing. The weight that the Board should attribute to the petition should be limited.

10.0 Circulation of Applicant's Response

10.1. Following receipt of the above, the applicant's response was circulated. The EPA had no further comments. The HSA requires an updated Land Use Planning QRA to be submitted (which was subsequently submitted). TII was concerned about the need for a design report on the junction with the N59 (also submitted later).

10.2. TII is satisfied that a Road Safety Audit will be supplied for the works to the national road system. It requests that a structural assessment be carried out for the structures on the national routes as well as the local road network. It notes that certain regulations must be met for the transport of abnormal loads.

10.3. Twenty-one observations were received from the general public. The observations are summarised here on a thematic basis. Some concerns, for example, in relation to construction traffic, have not been repeated below, but is a repeated concern.

Consultation

10.3.1. Rebuttal regarding invitations to meeting in public house.

Safety for Hydrogen Plant

10.3.2. The 90:10% split for indoor and outdoor use in the QRA is strongly rejected. Persons are working the lands and are outdoors as well as children play outside. There is no mention of livestock, which are farmed in the vicinity of the hydrogen plant.

Traffic

10.3.3. There does not appear to be a road safety audit of the L6612-1/N59 junction. Could it be based on the alternative site at Carrowleagh Bog, instead of Carraun? There is confusion between the L6612 and L6612-1.

10.3.4. There is no consent for the sight lines on the L6612-1, which require the cutting of hedgerow and none for the passing bays on the L6612. The applicant has offered no proof of consent for the rest of the project.

10.3.5. Entering the N59 will become more hazardous for residents. There will be difficulty navigating the turbines through Ballina. There has been no consideration of cyclists. There are drovers right on the local road and how will this be accommodated?

10.3.6. The bridges and roads need to be structurally examined. The concerns in relation to the scale of construction traffic and safety and vibration impact remain.

10.3.7. It is likely that the smaller hydrogen tube-trailers will be used, which significantly increases traffic on the road, to 176 truck movements.

Noise and Vibration

10.3.8. Noise from the hydrogen plant has not been properly assessed. The site is being reprofiled and the south elevation is on a 5 metre high slope. It is not clear how a plant that produces a noise output of 83 dBA can be reduced to 35dBA. There is a risk that resonance will be created by the building. The electrolyser will generate 48 dBA.

10.3.9. The noise contour begins at 70 dBA, but this will be 90 dBA at it's loudest, from the fin fan coolers. There appears to be little in the way of acoustic mitigation, given the height and scale of the building.

10.3.10. No calculations have been made to demonstrate that the vibration falls below 0.2 mm/s and no mitigation for vibration has been provided.

10.3.11. Infrasound from the wind farm has not been considered.

10.3.12. The noise condition on the previous grant of permission on the wind farm location is too generous and this has been updated since. The amenities of residents must be considered in summer, when windows are open. Indoor noise levels should not exceed 30 dBA.

10.3.13. There is no Paragraph 11.27.44, although it is referred to in the EIAR.

10.3.14. HH15 will be more affected by noise during construction than HH12 or HH14, which have been considered.

Viability

10.3.15. In the absence of a market, source of funding, etc. the viability of the hydrogen plant is questioned.

Property Devaluation

10.3.16. This has not been responded to by the applicant.

Prematurity

10.3.17. Premature in the absence of an SEA for hydrogen energy production.

Water Supply and Wastewater

10.3.18. There is insufficient water in the group water supply scheme to serve the proposed plant. Has Uisce Eireann consented to the proposed supply?

10.3.19. There remain concerns about the impacts on private wells, the effects on water quality of the rivers in the area and saline intrusion.

Light pollution

10.3.20. Concern over loss of dark skies.

Accuracy of identification of housing

10.3.21. The accuracy and consistency of housing in the analysis is questioned. HH10, HH13 do not exist. There is an uninhabited house to be renovated near HH14.

10.3.22. HH18 is shown on Fig. 1.3 but is not shown on noise contour map.

Proximity to wind farm boundaries

10.3.23. These should be 7 times the tip height, to avoid wind take.

Rare minerals /carbon calculation and alternative energy sources

10.3.24. Not satisfied that sufficient information has been provided in relation to the above. The demolition of the existing house has not been accounted for.

Dust

10.3.25. Dust during construction remains a concern and persons living in the area are already suffering ill health.

Bat Survey

10.3.26. This is not detailed sufficiently.

Fire Safety Certificate

10.3.27. None has been applied for.

11.0 Applicant's Rebuttal

11.1.1. Please note that the applicant has responded in a very detailed manner to the points raised and responds to each individual observer. Only a summary is presented here.

Mapping Errors

11.1.2. The applicant acknowledges that there has been an error in mapping of residences around the hydrogen plant location, in that HH10 and HH13, which are derelict, were included at approximately 500 metres west of their location. They are outside the noise contours and noise levels would be slightly lower than that identified. Revised Figure 1.3 and 11.9 have been submitted.

Design Report for TII

11.1.3. This has been included in Appendix A of the response. A Road Safety Audit and Traffic Analysis are provided as part of the Design Report. There is no specific safety data for the N59 / L66121 junction on the RSA website as geographical information on collisions is not currently available.

11.1.4. The junction is to be modified to provide safe access; additional road width; allow for turning movements, prevent HGVs from encroaching into opposing streams of traffic when turning, improve pedestrian safety and reduce conflict on the L66121 with traffic and development traffic.

11.1.5. Traffic counts were carried out on Wednesday 25th January 2023. The TII Traffic Counter at Rathglass, northeast of Corbally shows the AADT of the N59 being 4,203 vehicles with HGVs 3.6% of the traffic volume.

11.1.6. The report notes the N59's westbound approach (to Ballina) as having a gradient of 2% and the eastbound approach (to Sligo) has a gradient of 3.5%. The L66121 has a gradient of 1%. When realigned, it will have a gradient of +2.5.

11.1.7. There are a number of junctions and field access points on the N59. There are no pedestrian or cycle facilities.

11.1.8. Vision splays of 215m are available. Forward visibility is in excess of 215m. The parking area in front of the house will be removed. Surfacing on the N59 and L66121 will include skid resistance surfaces.

11.1.9. The autotrack submitted shows that articulated vehicles can turn left from the N59 and left from the L66121 without crossing the centre line of the N59.

11.1.10. A detailed structural assessment of bridges and structures on the road network is offered, noting that the N59 has been used for the transport of turbines for other wind farms.

Other Traffic Related Concerns

11.1.11. When operational, HGV traffic will not travel eastwards on the N59 past the L6611 or onto Ballina. HGV traffic will only travel towards Sligo and approach the junction from the west.

11.1.12. The L6612-1 has been referred to as the L6612, but the RSA has been carried out at the correct junction.

11.1.13. If tube trailers of 1200kg are not available, smaller tube trailers (384kg) will be use that are compliant with national regulations.

11.1.14. There will not be 176 truck movements in the event of smaller tube trailers being used (4.2.2. of Response Submission).

11.1.15. Reinstatement details for roads post construction will be agreed with the planning authority.

11.1.16. The bridge over the River Brusna can take the weight of construction traffic. However, the bridge surface is not deep enough to carry the cables, hence the need for the cables to be placed underground via HDD.

11.1.17. Traffic management will be in place to minimise inconvenience. The L1102 is part of the construction haul route. It has been assessed, including for traffic delays. Operational tube trailers will not use the L1102.

11.1.18. The movement of livestock will be catered for on Leafy Lane during construction works.

Public Consultation

11.1.19. Rebuttal argument on the public consultation process is made.

Technical Experience

11.1.20. The project team includes hydrogen specialist team members which have experience with generation, distribution, storage and utilisation, as outlined in the EIAR.

Consultation with the Fire Service

11.1.21. Consultations have taken place with the Fire Services, as outlined in the submitted documents. Workers will be trained in the operation of the plant and appropriate health and safety. Training for the fire service is outside the control of the applicant.

Insurance cover

11.1.22. Discussions with insurance agents confirm that there is no evidence that the presence of the hydrogen plant will impact on the ability to obtain insurance at the normal market rate. There has been no difficulties for the residents in proximity to Ballina Beverages, which is an Upper Tier COMAH site, in obtaining insurance at normal market prices.

House sales / planning permission

11.1.23. Property value is assessed in the EIAR. The applicant cannot comment on future planning applications.

Hydrogen Demand

11.1.24. There will be future industrial demand to decarbonise production as well as catering for the transportation industry. Future demand is also addressed in the *National Hydrogen Strategy*.

Livestock

11.1.25. Livestock has been considered in relation to water supply and noise (Sections 4.5.1, 4.5.3, 4.11 and 4.13.5 of the EIAR). Persons working with livestock have been considered in the QRA.

Legal Consents

11.1.26. Legal consents have been obtained for where they are necessary. Works in the public road are permitted to be undertaken by a statutory undertaker to provide services, under the planning regulations. No passing bays are being provided on the

lands identified by John Bourke. Where turbary rights are not affected, no consent is necessary (Carrabine plots).

Human Rights

11.1.27. The EIA does not cover human rights, which has been confirmed in recent case law.

Bedrock

11.1.28. The use of bedrock at the surface to anchor turbines is not necessary when a suitable subsoil can be used.

Access to MA 31-005

11.1.29. A route to the tomb will be provided by the developer.

International Experience with Hydrogen

11.1.30. Hydrogen is used internationally and this size plant is not excessive in scale.

Size of hydrogen plant on website

11.1.31. It is acknowledged that this is not to scale. The drawings show the scale of the proposed building.

Zone of Contribution

11.1.32. The Zone of Contribution is shown on Figure 3 of the document. It is not close to sea level in a hydrogeological context. The volume of groundwater yield is sustainable, given the balance between abstraction and recharge.

Financial Considerations

11.1.33. The financial aspects underpinning this private application are not required to be made publicly available. The sum identified for community gain is based on energy generation projections.

Noise Calculations

11.1.34. The hydrogen plant noise level of 83dB is an internal sound pressure level. The façade provides a noise reduction of 35dB. However, the noise contours do not begin at the external façade of the building. The noise levels do not disperse similarly to wind turbines, as the height is very different. In addition, there are no barrier or ground attenuation of noise, as occurs with the plant building. The noise levels were analysed

at maximum output, with all machinery working together. There will be a complaints system in place.

11.1.35. The predicted noise levels for the wind farm at House 1 and House 2 are above 43dB at night. These are derelict and have only been included for completeness. The noise levels will comply with the more stringent conditions attached to some wind farms.

11.1.36. The noise methodology complies with the 2022 EPA guidelines. A maximum noise level has been used for the hydrogen plant, again in accordance with EPA Guidelines.

11.1.37. In the unlikely event at operation stage, that the wind turbines exhibit some tonality at operation stage, this can be corrected. It cannot be predicted at planning stage. The STE is embedded mitigation in the blades, to reduce noise. Monitoring can be carried out. Enforcement can be taken if the wind farm is not operating in accordance with its permission. The 43dB LA90 is equivalent to an LAeq level of 45dB. WHO allows for a 15dB reduction through a partially opened window, so 45dB equates to 30 dB internally. When the window is shut, the noise reduction would be greater.

11.1.38. Noise levels from construction will be of the order of 33-52dBA at HH9 and HH10.

11.1.39. Light pollution is not a significant issue for HH5, which is 300m from the hydrogen plant.

11.1.40. The QRA is compliant with the HSA's guidance on Technical Land Use Planning Advice. It is incorrect that there is little or no legislation in place in Ireland in relation to hydrogen. The safety of vulnerable persons has been considered at the road junction in the Road Safety Audit.

11.1.41. The Finished Floor Level of the hydrogen plant is 50m AOD. Existing ground levels are 50 to 53m AOD. Landscaping is shown in the landscape mitigation plan in Appendix 12.2. No tree cutting will take place outside the red line. The interconnector is mostly within the roadbed.

11.1.42. The effect of security fencing has been considered in the Landscape and Visual Assessment.

11.1.43. No drilling during site investigations took place at night and no construction will be carried out at night either. The Enforcement Notice related to the temporary access track and was complied with.

11.1.44. A Fire Safety Certificate will not be submitted until post consent. A Major Accident Prevention Policy is included in Appendix 16.2 and Emergency Response Plan is included for construction issues.

11.1.45. The hydrogen plant has not been included to increase the 'green credentials' of the proposed wind farm.

11.1.46. In Northern Ireland, the Long Mountain Wind Farm is currently operating a hydrogen plant that also exports to the grid.

Applicant's Response to Áine McCann

11.1.47. This response was received separately by the Board on 15.04.2024. There is significant reiteration of points, which I will not replicate in full, in relation to traffic, safety issues, the nature of renewable energy, noise.

11.1.48. Errors in the documentation are minor in nature, which have been addressed in Further Information and do not undermine the evaluation of impacts.

11.1.49. The necessity for Ireland to develop its own energy supply is critical for energy security. Hydrogen is a replacement for fossil fuel, so will reduce greenhouse gas emissions.

11.1.50. Should planning permission be granted, construction drawings will be prepared. This does not negate that the environmental effects of the proposed development have been fully considered in the EIAR, NIS and CEMP. The scheme has been designed in accordance with the relevant safety standards.

12.0 Further Information Submissions

12.1. Following the request from the HSA that an updated QRA was required, this was issued to the applicant. This was circulated to observers and prescribed bodies. The responses the submission is set out below. Please note that many of the observations repeat earlier concerns, which have already been documented.

HSA Response

12.1.1. Based on the information supplied, the HSA confirms that the proposed development constitutes a new Lower Tier COMAH establishment.

12.1.2. The siting criteria for new establishments have been met.

12.1.3. The HSA do not advice against the granting of planning permission in the context of major accidents.

12.1.4. It is policy to advise planning bodies of worst case major accidents, in their decision making process. In this case the consequences relate to overpressure and that a level of 168mbar could be experienced at a distance of 360m from this location.

12.1.5. The advice only relates to the information on the particular dangerous substances at this time. Changes to this could alter this advice. Should those substances or their location change, then advice may change. Conditions should be imposed on this regard.

12.1.6. Future development around COMAH establishments has the potential to impact on the expansion of these establishments.

TII

12.1.7. A Design Report is still required for the proposed realignment of the N59/L66121-1.

12.1.8. Any works to the National Road Network to facilitate turbine delivery shall be subject to Road Safety Audit.

Observers

12.1.9. The use of English to respond to observations written in Irish and request that responses are provided in Irish.

12.1.10. Numerous errors have been made in the application and it should be invalidated. An SID application for a Biogas plant in Gort was subject to judicial review because of such errors and underestimated the volume of gas being stored at the plant. The noise chapter, for example, uses Castleconnor as the address for the hydrogen plant.

12.1.11. The project should not be subject to future design development. All details, including equipment, should be provided at planning stage.

12.1.12. Hydrogen gas is not a renewable energy source. It becomes ‘grey’ if electricity is directly used from the grid.

12.1.13. Water pressure could be lowered.

12.1.14. The River Moy is tidal up to Ballina town, and this is 3.5km distant, not 7.5km as stated.

12.1.15. A private well has not been considered at Susan Donegan’s property and could be depleted.

13.0 **Oral Hearing Summary**

13.1. Having regard to the absence of a response from Mayo County Council at the time, concerns from Sligo County Councillors and observers and missing technical information, an Oral Hearing was recommended. This agreed by the Assistant Director of Planning, Paul Caprani.

13.2. An Oral Hearing was held on the 20th and 21st of March, 2024. It took place via Microsoft Teams. A digital recording of the proceedings, copies of written submissions and the list of contributors are attached to the file. Ms. Claire Rowland provided translation services on behalf of the Board, on the 20th of March, so that observers who made their submission in Irish were able to be understood by those taking part in the hearing. One of the participants requested reasonable accommodation and this was provided.

13.3. Appendix 2 provides a record of the Oral Hearing. I also recommend to the Board to review the presentations made by both the applicant and observers during the oral hearing. Presentations include photographs, which visually illustrate the points being made.

13.4. The applicant's team responded to Inspector's Questions set out in the Oral Hearing Agenda and to the presentations made by Observers.

13.5. This section of the report will summarise the main points made at the hearing.

EIAR and Emergency Preparedness

13.5.1. The screening for EIA could have included more classes than originally considered, but the main issue was that an EIAR had been submitted as required. The preparedness for an emergency and response to it were considered under Preliminary Hazard Analysis and Quantitative Risk Assessment. Engagement had taken place with the HSA and Sligo Fire Service. There are two SEVESO sites in Ballina – one an Upper Tier and the other a Lower Tier, so there is preparedness for this type of development. At later stages of the project and in relation to requirements from other agencies, further refinement will occur.

13.5.2. The QRA was updated at the hearing, to demonstrate that the commonality of the baseline maps and the consistency of the safety contour lines. These contour lines represent worst case scenario and are expected to reduce in extent during detailed

design development. The outer contour line is not expected to inhibit the development of housing in the future.

13.5.3. Should a hydrogen leak occur, it is most likely to simply dissipate to air. Should a fire or explosion occur, it is not expected to spread offsite.

13.5.4. Observers were not generally satisfied with the response. Concern was raised about the safety of persons being outdoors (working or for recreation purposes), the impact on property values of houses and the ability to obtain planning permission for housing in the future. The issue of household insurance was also raised. The applicant supplied a letter from an agent stating that housing next to the Upper Tier Seveso site in Ballina had not experienced an increase in premiums due to their location.

Traffic Safety, Use of the N59 and Local Roads

13.5.5. A design report for the proposed junction with the N59 was submitted. A commitment was made to limit tube trailers to a maximum of 52 movements over a 12 hour period. Observers were very concerned about traffic safety during construction and operation. During construction, the road diversions would force larger vehicles onto unsuitable roads, which could cater for single small vehicles only. Cyclists would be particularly vulnerable, using the Eurovelo route. Ambulances would be delayed reaching vulnerable people. Noise from the construction vehicles could adversely impact on health (see submissions from Ms. Grace and Ms. Marcelle Dempsey). The applicant committed to ensuring that in the event that an ambulance was required, construction traffic would be made aware to ensure that no delay would occur.

13.5.6. The level of accidents on the local road network, including the N59 were documented by observers.

13.5.7. Sligo County Council considered that the intensification of an existing access onto a national road was contrary to Sligo County Council's national road policy.

13.5.8. The applicant’s team argued that due to the low level of use of the junction, no material intensification of use arises. The improvement works to the junction would improve road safety for all. Direct access from wind farms to national roads had been approved by the Board previously – Oweninny wind farm on the N59 in Mayo, Cloghan Wind Farm and Derrinlough Wind Farm to the N62 in Offaly and Inchamore Wind Farm to the N22 in Kerry.

Public Consultation

13.6. As a general point, the dissatisfaction with the public consultation process was a reoccurring theme in the oral hearing. It should be noted that the consultation process was considered inadequate and inappropriate by many observers, due to the absence of direct, individual consultation and the limited number of adjoining landowners invited to a local meeting. Consultation only began in Carraun until after the decision was made to move the hydrogen plant from Carrowleagh to its current location. While newsletters were sent to houses, these were not considered 'official consultation'.

13.7. Radio ads, newspaper ads, Virtual Information Days and Public Information Days were held as well as meetings with some landowners.

13.8. It was suggested that the community benefit scheme reduced what would otherwise be more numerous opposition.

Noise and Vibration

13.9. This chapter was updated at the Oral Hearing. New, cumulative noise contour maps was submitted by the applicant for the wind farm. Noise from the hydrogen plant was questioned by Observers, due to the absence of specification of equipment.

Legal Ownership

13.10. The legal ownership of the wind farm location was clarified. A list of landowners, addresses, folios and consents were provided. This included the Biodiversity Enhancement Management Plan area and a new blue line was submitted. Works to the public road will be carried out by a statutory undertaker.

Worst Case Scenario

13.11. This was submitted at the Oral Hearing for each chapter and the mitigation measures were confirmed to be adequate should the circumstances arise.

Appropriateness of the location of the Hydrogen Plant

13.12. The location of the hydrogen plant was challenged by Sligo County Council and Observers. The council did not consider that the plant had a locational need to be in a rural area. Instead, it would be more appropriately located in an industrial area, or co-locate with a business that required to decarbonise. Observers concurred and questioned the appropriateness of the location in relation to residential properties.

Visual Impact

13.13. The visual impact of the scheme was considered, as Mayo and Sligo County Council were concerned about this matter. The applicant's team stated that the taller wind turbines in the foreground and on lower ground than existing wind turbines, albeit less high, would not visually jarring. The landscape, in a preferred area for wind farms, is robust. The hydrogen plant cannot be broken into smaller units due to the process but would resemble a large agricultural building. Views of the proposed building are limited and intermittent, due to topography.

Impact on Archaeological Monuments

13.14. The impact of the turbines on the court tomb, MA031-034 was of concern, in that the turbines might impinge on any alignment of the tomb with the rising sun during the solstice periods. The applicant's team are satisfied that while the tomb is aligned on an east-west axis, this did not inherently mean that there an alignment with the solstices. The longevity of the impact on the setting was emphasised. The applicant offered to provide pedestrian access to the tomb.

Ecological Impacts

13.15. Significant concern in relation to bats, fish and the freshwater pearl mussel was raised. The applicant's team offered to curtail the turbines nearest to the forest line during dawn and dusk. It was noted that this mitigation has been effective on other wind farms, reducing bat mortality to nil.

13.16. The risk of pollution from sedimentation during construction and from pollution during operation of the hydrogen plant was raised. The Dooyeaghny Stream provides for salmon and trout, as has been established by the IFI. Any miscalculation, any breakdown in the telemetry system, could have catastrophic effects.

13.17. The loss of springs feeding the Dooyeaghny due to groundwater depletion would have a detrimental impact on surface water flows.

13.18. The applicant was satisfied that the conditions required by the IFI could be met and that no detrimental impact would arise. A reduction in flow would lead to the cessation of groundwater pumping and alternative sources of water from rainwater harvesting or from the mains system could be utilised. Discharge from the plant would

be held back in the event of low water flows on the Dooyeaghny Stream. There is adequate attenuation and storage space for this.

13.19. The cumulative effect of wind turbines would have a barrier and displacement effect on birds and bats, creating habitat fragmentation. The applicant's team did not consider that the proposed development would lead to a barrier effect.

Property Values

13.20. The reduction in values of homes from the presence of the hydrogen plant was of great concern. Most people's wealth is contained in their homes and this could be eroded. At pension age, there is no opportunity to recuperate this value.

13.21. The opportunity for family members to live on family land in the future could be curtailed by their location within the safety contour lines.

Absence of a market for hydrogen fuelled vehicles

13.22. The price of hydrogen to the end user as a fuel and the price of conversion of vehicular fleets to hydrogen use was interrogated. The absence of an indigenous market would hamper the role of out hydrogen, making the plant unviable. The pressure at which the gas would be delivered was questioned, given the reference to hydrogen at 700 bar pressure on the European motorway routes.

Depletion of groundwater

13.23. The potential groundwater from wells to serve agriculture is a significant threat. The applicant presented drawings showing that the zone of contribution would not impact on properties south of the Dooyeaghny Stream. The Factor of Safety is 1.5 and is conservative.

Turbary rights / Spoil Deposition

13.24. The individual's right to cut turf was referred to. Questions were raised on how spoil deposition would impact on plots. The applicant confirmed that no spoil deposition would take place on lands not within the control of the applicant. Access to persons to cut turf would be organised during construction.

Light pollution

13.25. Light pollution from the hydrogen plant and wind turbines will arise in this rural area, which is generally dark at night.

Failure of the Board in relation to certain matters

13.26. A number of criticisms were made against the Board. These included slowness in dealing with Irish language submissions and the sending out of English language submissions in advance.

13.27. There was limited time to read Mayo County Council's submission. An offer was made to reconvene the hearing, but was rejected.

13.28. One submission had not been forwarded to the applicant. This was corrected.

13.29. The use by the Board of differing numbering of the case file made it difficult to find on the website. This refers to the use of PA16.317560 but then the use of ABP-319570-24 on letters, etc.

14.0 Submissions following Advertisement of Information received at Oral Hearing

14.1. At the Oral Hearing, drawings were submitted which altered the blue line boundary, showing an additional 10.6 ha within the control of the applicant. This area is to be subject to a Biodiversity Enhancement Management Area, a mitigation measure for the permanent loss of peatland habitat. This area was not included in the application blue line boundary and was not referred to in the public notice for the proposed development. The Board, in the event of a grant of planning permission, would not have been able to condition this mitigation measure, without the lands being within the blue line. This necessitated re-advertisement and new public notices.

14.2. Twenty-four submissions were made in response to the advertisement, which required submission by 29.05.2024. Two of these were made in Irish. Four of the submissions were new and generally relate to consent from persons with turbary rights. Many similar points have been made previously, by the observers or others, and have not been reiterated.

Aileen Bourke

14.2.1. Ms. Bourke is a traditional Irish music teacher. She teaches from her home in Carra, Bonniconlon. She is concerned that her pupils will be adversely affected by construction traffic on the road. She points to errors in the descriptions of roads in the EIAR and refers to inaccurate information to the open days on the 14th and 15th of September, 2022. There are family lands on the haul route and she hopes to apply for planning permission. She is concerned about the proposed cables interfering with existing underground services. Other concerns related to emergency access, the elderly living in the area, the unsuitability of the diversion routes for tractors and trailer or horse lorries. She does not consider that a shuttle service would make sense. She considers that the proposed development should be in an industrial area.

Aileen Ní Dhuinneachair (translated from Irish)

14.2.2. The location of Turbines 11 and 6 will affect the relationship between the tombs and the alignment of the sun during the equinoxes for the rest of her life. The two tombs were constructed 1,000 years apart. MA031-034 is the older Court tomb, dating back to between 3900 and 3500 BC.

14.2.3. The applicant's expert has completed a thesis on Wedge tombs, which is not the same and her thesis did not cover MA031-005. Wedge tombs, according to Ms. Robb are burial tombs which also may have been used in for sky rituals, potentially for celebratory festivals held at particular times of the year. The purpose is particular to the location and MA031-05 has not been studied in this regard. Neither has M031-034. Without study, there is insufficient evidence in relation to the tombs alignment. A grant of permission would run this study.

14.2.4. MA031-005 is close to the road and could be affected by road widening.

14.2.5. The impact on ground water supply after 10 days of pumping is a concern. Other springs could be affected.

14.2.6. Could electricity be sourced from the grid, so the hydrogen is no longer 'green' energy?

14.2.7. The property overview is nearly identical to that submitted with the applicant. Evidence of written permission should be provided.

14.2.8. The Euro Velo 1 route has not been fully taken into consideration.

Aine McCann

14.2.9. Ground water in the area has a high calcium content from its limestone bedrock and high Ammonium Nitrate levels, associated with fertilisers in a farming area. Ionic deposits are to be dealt with by way of electrolysis as part of the overall filtration system. This does not tally with the system proposed in Appendix F of the Minerex groundwater report. That report does not relate to this site. It is not clear why this has been included and does not reflect the complexity of this case. [*Inspector's note – Appendix 5 in the Minerex report in relation to groundwater supply assessment relates to other matters, so I am unclear on this reference.*]

14.2.10. Increased calcite deposits, which occurs faster in warm conditions increase the risk of hydrogen embrittlement.

14.2.11. Raised NH_3 (ammonia) could make its way to Dooyeaghny Stream. The attenuation area, not lined with peat, has not been discussed in terms of its ability to absorb and percolate the discharged water without causing direct runoff.

14.2.12. If Borehole 6 silts up, there may be little chance of finding another productive borehole in the site. This would increase reliance on rainwater or the group water scheme. The water from the group water scheme would require de-chlorination.

14.2.13. Groundwater recharge is low in the area and will be further limited by buildings. The transmissivity tests are not provided. Groundwater supplies can decrease in summer. The impacts of pumping on the two springs on site is not known and it may affect the Dooyeaghny Stream. It was wrongly attributed to low rainfall, not the action of pumping. Photographs (which did not include a meter stick to indicate levels) show changes in vegetation with watercress appearing. The presence of elodea flowing in the water shows that there is clear, slow flowing water present all year round. The bryophyte around the spring will not be able to be maintained. No ecology report has been provided for the spring. There is the possibility of Annex I species such as *Saxifrage aizoides* (yellow saxifrage). Local rainfall levels may not be the same as Knock Airport, some 40km to the south.

14.2.14. The IFI have concerns about the water quality of the area, which has to remain hight to protect the salmonoid and other protected species. Sedimentation is a concern. The springs are directly connected to the Dooyeaghny Stream and the Moy SAC.

14.2.15. There is a well 217m from BH6 which was not considered (in the farmhouse of Mrs. Susan Donegan). The domestic well does not appear on EPA or GSI maps.

14.2.16. Concern that the person taking readings from FW1 was not qualified to do so and this invalidates the findings.

14.2.17. There are rainfall data sets from Easky-Bunowna, 20km from the site, up until 2021. These show lower rain fall levels than the site chosen. It is a reflection of the lower elevation of the site in relation to that chosen (24m vs 94m). A table demonstrates this difference, with significantly more rain at Knock (on average 16.25mm). The information indicates that the figures applied are not pertinent. The Zone of Contribution is inaccurate as it is based on rainfall data sets that are not applicable to the local area. The water use may not be sustainable, as required by the Water Framework Directive. Annex I Fresh Water Mussell and salmonid species could be effected.

14.2.18. Hydrogen sulphide was detected at pumping which could cause wear and tear on pump seals. Acids used to clean the pump and lines could end up in the ground water.

14.2.19. Glycol and lye are toxic to aquatic systems.

14.2.20. Peat should not be moved from the wind farm site to the hydrogen site as it is not a suitable topsoil and could add to sedimentation. Again, there could be impacts on aquatic life through increased sedimentation.

14.2.21. No permission has been given by turf plot owners for the storage of extracted peat on active plots at Turbine 12 and 13.

14.2.22. The maximum amount of hydrogen stored on site could be underestimated due to hydrogen in the production equipment during operation, such as piping. No dimensions have been given and potentially another 1,000kg could be stored there, bringing the site into Tier 1 status for COMAH. The hydrogen fuel in the tub trailers should also be calculated (potentially 6.85 tonnes) and the hydrogen in the electrolysers estimates as 1.482 tonnes). The upper tier threshold is 50 tonnes. The risk of meeting this tier is high. A Tier 1 site would not be located in a residential area.

14.2.23. The pressure that hydrogen will be stored at is stated as 500bar in Hazard Log Report, but the tube trailers operate at 384bar, in the EIAR.

14.2.24. The diesel tank on site is not identified the hazard risk report.

Bartholomew and Jackie Morrisroe

14.2.25. Other letters of consent should be submitted, including from the planning authorities. There is no evidence of consent for the passing bays. There is a significant traffic hazard during construction. The Mayo County Council letter of consent is not from headquarters.

14.2.26. The underground cables could affect turbary rights and no letters of consent have been given.

14.2.27. There are fee simple rights on the bog when the turf is fully cut away. These go to commonage owners.

14.2.28. The description of the bog plots are inaccurate as they are not typically 50mx180m and there are not over 620 plots as stated by the developer.

14.2.29. The bog is known locally as Kilbride and not Carrowleagh, so plot owners were not aware that they were affected.

14.2.30. T2 and T4 hardstands traverse two of the access roads to the bog, thus affected 323 turbary plot owners, particularly during construction. How is T5 to be accessed?

14.2.31. Further inaccuracies on road naming are identified.

14.2.32. No other wind farm developed by Mercury Renewables have been identified.

Brendan and Helen Routledge

14.2.33. They state that they are the owners of the turbary rights to two plots where T13 is to be erected. Their turbary rights will be destroyed. There is sufficient turf to fulfil their needs for 30 years. They have given no consent.

Bríd Nic Gabhann (translated from Irish)

14.2.34. Cycling on the Euro Velo 1 route will not be possible during construction and tourism in the county and Sligo will suffer. People's health will be impacted.

Danny and Sandra Beardshall

14.2.35. Similar points to above in relation to letters of consent. passing bays, Mayo County Council and impact on springs.

Deirdre and John Bourke

14.2.36. Electrical transmission line routes should be chosen having regard to international best practice. Structural damage to homes might arise during construction. The hydrogen plant will be using electricity, not supply it so the RESS does not apply. How will the plant be turned off if there is no wind? There is no locational need for the plant to be in Mayo. There will be a huge environmental impact on the site, over and above the much smaller permitted wind farm. The construction hours suggested by Mayo County Council are too generous.

Edel Gallagher

14.2.37. Similar issues in relation to cycling and the international aspect of the Euro Velo Route and its development and concerns in relation to ground water.

IFI

14.2.38. Monitoring of the springs on site are required as these are the source of the South Corbally Stream, which is the subject of significant investment for habitat enhancement. The flow regime should not be interfered with. Trigger levels are required for mitigation and should be high enough to ensure the viability of the downstream fisheries habitat and the IFI wish to be consulted on this. A mechanism

is required to ensure that abstraction can be stopped in case of damage to the fisheries habitat.

14.2.39. Consultation is requested in relation to the ongoing flow monitoring and assimilative capacity calculation for the discharge into the Newtown River.

Jennifer Harrison

14.2.40. There is no consent from Ms. Harrison's family regarding access to their turbary plots. Similar issues are raised in relation to cabling, hard stands for turbines, access, impacts on underground heritage, bird and bat information, groundwater, construction traffic and absence of knowledge of Mercury's other projects.

John Bourke

14.2.41. No consent for proposed passing bays on L6612 or on the bog. Construction concerns, in particular in relation to livestock. No market for hydrogen exists.

John Dooley and Val Martin

14.2.42. The wind energy guidelines do not have an SEA and so the application should be rejected, as per C-24/19, as Article (3)(2) of the SEA Directive requires that energy plan used in town planning and which the framework for future consents require an Environmental Assessment.

14.2.43. Concerned about obtaining household insurance at normal rates.

14.2.44. The hydrogen plant could explode as it is reliant on wind, which is an intermittent source of power. The application should be rejected and redesigned for constant supply of electricity from the grid, to avoid the risk of explosion at low power levels. A Preventative Maintenance Plan is required. The proposed development is unsafe close to residences due to dangers from shrapnel. The electricity supply from the grid is reliant on fossil fuels. An EIAR is required for the wind farm and the hydrogen plant. The qualifications of persons who contributed to the EAR is not given in the Non Technical Summary.

14.2.45. The noise from wind farms is terrible and shadow flicker conditions can be ignored.

Joseph Queenan

14.2.46. Concern about construction traffic, groundwater, impacts on the Dooyeaghny Stream and local wells and the use of rainwater data from Knock.

Kieran Cummins

14.2.47. Concern about consents, no labelled passing bays, digging up the public road, incorrect information, ownership issues, groundwater depletion, private wells, inadequate data and the Euro Velo Route.

Leona Mulrooney & Others

14.2.48. Children have not been taken into account in the application. They would be at risk of traffic hazard or explosion if playing outside. Similar concerns to those outlined above.

Marcelle Dempsey

14.2.49. Concerned about construction traffic and that a dedicated telephone number in the event of an emergency for Gra

14.2.50. Grace Dempsey is not enough. The impact on her life would be significant. There is a defibrillator opposite, that may be inaccessible due to traffic.

Michael Ruane

14.2.51. Concern about impact on turbary rights.

Niall Fox

14.2.52. He was unaware that the information from his well would be used in the planning application. No consent has been given for the use of this information or about the farm. It will take many years for carbon offset.

Noel and Lisa Ruane

14.2.53. Similar concerns in relation to traffic, consent, water and safety of the hydrogen plant and height of the wind turbines.

Oliver Carney

14.2.54. Has turbary rights, located under a turbine and does not give consent.

Patrick Donegan Senior

14.2.55. No permission for passing bays on the land or for services to be laid in the road. There is no letter of consent from Patrick Donegan Junior. The road is not suitable for construction traffic. There is no legal obligation to cut vegetation on a public road. There was concern that the land would be taken via compulsory purchase.

Peter Carney

14.2.56. Concerned that he will not have access to his turf over the hard stand for the turbine and implications for turf cutting.

Tom Tuffy

14.2.57. Concerns about construction traffic and the potential for traffic accidents, the Euro Velo Route, the absence of a SEA and the heights of the turbines. There should have been a public notice at the N59 at Corbally. The hydrogen plant should have been located at a port. The ecology of the bog should not be destroyed. Flora and fauna should have been more closely examined. The loss of groundwater to streams in the short term will be multiplied over a long period. Domestic wells could suffer.

Susan Donegan

14.2.58. Ms. Donegan's private well is 200m from boreholes 6 and 7 and is in the buffer zone. There is no castle nearby as referenced in the Minerex report. The laying of cables could damage the well. The issue was raised in the original submission.

15.0 Applicant's Response to the Submissions following Re-advertisement

15.1. The applicant's response is summarised as follows:

Response to the IFI

15.1.1. SP1 has been identified in the Groundwater Supply Assessment as one source of the South Corbally Stream. These will be monitored and once an agreed trigger level has been reached, abstraction will stop. The proposed development's approach has been to blend water supplies is a form of mitigation, which reduces both the amount of groundwater required and the concentration of groundwater and discharging effluent under favourable conditions.

15.1.2. In a worst case scenario, of extended drought conditions, groundwater will not be used as source of supply, the hydrogen plant can shut down or else use mains water. However, as peak hydrogen production will coincide with peak wind production, and this occurs at higher periods of rainfall, this is unlikely to occur.

15.1.3. The Newtown River is north of the hydrogen plant, as identified from the EPA maps. The applicant will adhere to any conditions regarding this river.

Response to General Points Made by Observers

15.1.4. A table is included with directs the reader to the location of the response to documents already submitted.

15.1.5. In relation to turbary tights, the applicant has consents for 97 of the 600 plots. A number of sources were used to establish plots, including land registry, a historic map from the Department of Agriculture and topographical survey. There may be some inconsistencies, but the layout and the plots have been reviewed ad all infrastructure, including drainage, are located within these plots. No Compulsory Purchase Orders are in place and these are only for public bodes.

15.1.6. Diesel fuel tanks have been considered as part of the design and risk assessment of the project. However, the diesel emergency fuel tank is not considered a COMAH substance, due to the small volume.

15.1.7. The proposed development is a lower tier plant, and the consultants have reviewed this following submissions regarding the quantity of hydrogen stored.

15.1.8. The readings taken at FW1 were taken by water level sensors, which have continuous monitoring and manual dip readings which validated this information were taken by trained personnel.

15.1.9. Rainfall data was used from stations with long term historical data sets.

15.1.10. The name Firlough was used as Carrowleagh is in use by Eirgrid's Carrowleagh substation.

16.0 **EIA**

16.1. The EIAR contains a Non-Technical Summary, Main Volume, Figures and Drawings and 3 no. of appendices. A book of photomontages for the LVIA is presented. Please note that issues raised in the Oral Hearing and responses to it have been considered in this section.

16.2. **Compliance of the EIAR with Article 94 of the Planning and Development Regulations, as amended**

16.2.1. Article 94 of the Planning and Development Regulations sets out the contents of an EIAR. An assessment of these requirements is set out in the table below.

Table 1: Article 94 Compliance

1. The information specified in Paragraph 1 of Schedule 6		
	Description of proposed development: Site, design, size and other relevant features	See Chapter 2. This includes details on the site, design, size and relevant features. The description is adequately detailed to allow assessment of the likely effects on the environment.
	Likely significant effects on the environment	See Chapters 4-16. Each of these chapters describes the significant effects on the environment. Chapter 11 was updated at the Oral Hearing.

	Design and mitigation measures to avoid, prevent and reduce significant adverse effects	See Chapters 4-16 and associated appendices and summarised in Appendix 17.1. I am satisfied that the mitigation measures are sufficient to minimise the environmental effects.
	Reasonable alternatives and main reasons for the option chosen, taking into account effects on the environment	See Chapter 3. This includes a 'Don-Nothing' Scenario and a range of alternatives. The environmental effects have been considered in relation to the 'Do-Nothing' Scenario
Any additional information specified in Paragraph 2 of Schedule 6 relevant to the specific characteristics of the development concerned and the environmental features likely to be affected and methods of assessment		
(a) Description	Description of location	See Chapter 2
	Physical characteristics including where relevant demolition and land use requirements during construction and operation	See Chapter 2. Please note that there is no demolition involved.
	Main characteristics of the operational phase	See Chapter 2.

	Estimate of expected residues, emissions and waste (type and quantity) in construction and operation	See Chapters 4-16.
(b) Reasonable Alternatives		See Chapter 3.
(c) Baseline scenario and 'Do Nothing'		The baseline context is provided. The 'Do-Nothing' scenario has been included
(d) Factors likely to be significantly affected	Population and human health	See Chapter 4.
	Biodiversity	See Chapters 5,6, and 7.
	Land	See Chapter 3.
	Soil	See Chapter 8.
	Water	See Chapter 9.
	Air	See Chapter 10.
	Climate	See Chapter 10.
	Material Assets	See Chapter 13.
	Noise and Vibration	See revised Chapter 11.
	Cultural Heritage	See Chapter 14.
	Landscape	See Chapter 12.
(e) Significant effects		See Chapters 4-16.

(i) Description of: (i)	(I) Construction and existence of proposed development and demolition	See Chapter 3, Appendix 2.1.
	(II) Use of natural resources	See Chapter 8 and 9.
	(III) Emissions	See Chapter 2,9, 10 and 15.
	(IV) Risk to from accidents or disasters	See Chapter 16. Appendix 8.1, 9.1, 9.2, 15.3, 16.1, 16.2 and 16.3.
	(V) Cumulative effects with existing or approved developments	Considered under main chapter headings and Appendix 2.
	(VI) Impact on Climate and vulnerability to Climate Change	See Chapters 9, 10 and associated appendices.
	(VII) Technology and Substances used	See Chapter 3
(ii) Likely Significant Effects	Direct	Considered under main chapter headings.
	Indirect / Secondary	Considered under various chapters.
	Cumulative	Considered under various chapters

	Transboundary	Not relevant in international terms. The location of the proposed development in two planning authorities is considered.
	Short term	Most construction effects are short term.
	Medium Term	Not generally relevant.
	Long Term	Considered for operation.
	Permanent	Considered for the hydrogen plant and underground connections.
	Temporary	Most construction effects are short term.
	Positive	Positive in relation to climate change.
	Negative	Most construction effects are negative. During operation, there will be negative effects.
(f) Forecasting methods, evidence, difficulties encounters and main uncertainties		Yes.
(g) Measures to avoid, prevent, reduce or offset adverse effects, monitoring during construction and operation		Yes.

(h) Significant adverse effects arising from vulnerability to risks of major accidents and/or disasters, mitigation measures and preparedness and response to emergencies arising from such events	Purpose of application to avoid this, risks during construction considered and mitigated for.
Non-Technical Summary	Yes – the Non Technical Summary accurately reflects the chapters in the main volume.
Reference list of sources	This is provided for each chapter.
List of experts and their competence	This is provided for each chapter.

16.2.2. I conclude that the EIAR complies with Article 94 of the Planning and Development Regulations, 2001, as amended.

16.3. **Non-Technical Summary (Volume I)**

16.3.1. The Non-Technical Summary (NTS) sets out the process of EIA, including scoping, baseline studies and findings. The scoping process was informed by a consultation process with prescribed bodies. Public consultation was carried out during the design process, which led to changes in project and location of the hydrogen plant. Due to Covid restrictions on in-person gathering, the first round of consultation was via a virtual public exhibition, following a leaflet drop and publication in local newspapers. A second round of consultation took place in person, once restrictions allowed. Two Public Information Days were held in September 2022 in Bunnyconnellan and Caslteconner, which ran from midday to 20:00. Project newsletters were produced on four occasions.

16.3.2. The NTS sets out the project and the main chapters of the EIAR and explains the meaning of the terms used. I note that the NTS specifically refers to major accidents or natural disasters. The four main risks identified are ‘Transportation of Hydrogen

during Operation', 'Peat Stability during Construction', 'Contamination' and 'Industrial Accident Fire/Gas Explosion'.

16.3.3. ***Inspector's Comments and Conclusion***

16.3.4. I consider the document an accurate reflection of the chapters in the main volumes.

16.4. Main Volume of EIAR (Volume II)

16.4.1. The main volume of the EIAR consists of 17 chapters. The chapters generally cover the areas that are required to be covered under the EIA Directive, updated in 2014 and as set out in Schedule 6 of Part 2 of the Planning and Development Regulations, 2001, as amended. Additional information was provided in the course of the application and at the Oral Hearing. This has been incorporated into the assessment.

16.5. Introduction

16.5.1. This chapter sets out a glossary, information on the developer and a summary of the project description. Information is provided on the previous planning permission on the wind far location and a comparison made between that and the proposed wind farm. The proposed number of turbines have been reduced from 21 to 13; but the turbines have significantly increased in terms of the power that can be generated, from 2.3MW to 5-6MW. Tip height increased from 120.5m to 177m to 185m. The total power output was 48MW and 65-78MW are proposed.

16.5.2. For the wind farm location, there are 18 no. inhabited houses within 1.5km, rising to 46 no. houses within 2km. The hydrogen plant location has 22 No. inhabited houses within 1km, with the nearest house within 299 metres of the location.

16.5.3. A screening for EIA is carried out. It finds that a mandatory EIA is required, as the proposed development comes under Class 3 (i) of Schedule 5 of Part 2 of the Planning and Development Regulations, 2001, as amended, being an installation for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output of more than 5 MW.

16.5.4. Table 1.3 outlines how the chapters conform to the topics that require to be studied under the EIA Directive. The chapter refers to a list of guidance documents referred to in the chapters. The competency of the Project Team that prepared the EIAR is described.

16.5.5. Different turbine ranges are assessed. This mainly effects shadow flicker, bat mitigation measures, ornithology, carbon calculator, a marginal impact on noise, visual impact (including in relation to cultural heritage) and the haul route.

16.5.6. The hydrogen plant impacts are assessed on the basis of maximum output and storage volumes, save in relation to carbon losses and savings, which are considered in a range of 10MW to 80MW output.

16.5.7. A table on the responses to the scoping study is provided. The list of organisations contacted is comprehensive and where detailed responses were made, the main points are summarised. Separate columns to assess the implications for the design of the project and where the responses are assessed in the EIAR. The scoping results have informed the EIAR.

16.5.8. More information is provided on consultation.

16.5.9. The community benefits package is outlined. This would provide for €500,000 per annum for the first 15 years of operation and will be administered by a management committee. The fund will support local projects, clubs, schools, education grants, tourism projects, sports and energy efficiency programmes.

16.5.10. The capital costs of the project is of the order of €200 million and would generate 100-150 jobs during construction stage and 10-12 jobs during operation.

16.5.11. Annual rates for the wind farm are of the order of €650,000 to €780,000 over the 40 years of operation.

16.5.12. ***Inspector's Comments and Conclusion***

16.5.13. The Introduction provides information on the competence of the EIAR team that has prepared the report. The scoping section is detailed and demonstrates how concerns from stakeholders have been considered in the preparation of the EIAR. I reviewed Part 1 and Part 2 of Schedule 5 of the *Planning and Development Regulations* 2001 as amended and was not satisfied that the EIAR was produced on the basis of the scale of the number of wind turbines and power produced. The proposed hydrogen plant alone would have generated a requirement for an EIAR on its own, being for the production of basic inorganic chemicals. I was concerned that adequate attention may not have been paid to the preparedness for an emergency response in the event of an energy and the relevant environment al issues arising from

that (as per Schedule 6, 2(h) of the said Regulations). However, following the Oral Hearing, I am satisfied that this has been adequately considered. The chapter is considered acceptable.

16.6. **Project Description**

Issues Raised

16.6.1. The application should have included for the demolition of the house and its rebuilding.

16.6.2. The location of passing bays are not known.

Context

16.6.3. The project description is set out in Section 3.0 of this report.

16.6.4. The purpose of the hydrogen plant is to make beneficial use of the power generated by the wind farm, that cannot be exported to the grid. The hydrogen plant will be built in a single construction phase and with the modular electrolyser installed in 5MW batches, with an initial batch of 10MW. The maximum hydrogen that can be produced is 31,200 kg of green hydrogen per day, if the entire power output of the wind farm is directed to the hydrogen plant. This is dispensed into tube trailers and the maximum capacity of this is 26 per day.

16.6.5. The amount of hydrogen produced will depend on the amount of electricity produced by wind. However, the highest month for production is likely to February and lowest during the summer months. This coincides with highest and lowest rainfall.

16.6.6. Minerex Environmental Ltd carried out a groundwater supply assessment for the hydrogen plant. It found that sustainable yields 232 cubic metres per day could be achieved from two boreholes. The water demand is 178 cubic metres per day. Following testing, the water quality was found suitable for electrolysis use following a treatment process.

16.6.7. The layout of the wind farm was informed by a series of constraints, which included no works within 50m of a watercourse and 20m from a land drain; no works within 100m of archaeology monuments and structures; set back from the Carrowleagh Wind Farm; avoidance of ground slopes in excess of 10%; and preferred locations to minimise peat removal and maximise use of existing tracks. Thirteen locations were chosen.

16.6.8. The wind turbine heights from foundation to tip will be 177m to 185m and can generate between 5 and 6MW each. The turbine foundations will be between 22 and 25.5m in diameters and will have a depth of 2.5 to 2.85m. The hardstands for crane will be constructed first and will be 3,600m2 in area and a depth of 0.6 m.

16.6.9. The hydrogen plant location was chosen due to its proximity to the national road network, limited visual impact, distance from housing and access to an underground water resource. The Sensitive Rural landscape area to the south was avoided.

16.6.10. The electrolyser building will house the following equipment – 16 no. electrolyser stacks, 4 no. transformers to step down the voltage, rectifiers to convert the electricity from AC to DC, gas/ lye separators and gas scrubbers to remove any residual lye. Oxygen is then vented to the atmosphere. Other equipment includes a compressor to reduce the pressure of hydrogen, a deoxidizer for remove residual oxygen and a dryer to remove moisture. Gas holders will contain hydrogen and oxygen, nitrogen production equipment and a control room.

16.6.11. An Alkaline Water Electrolyser will be used. Lye, which is potassium hydroxide is an alkaline and is toxic to aquatic organisms, increase the pH of soils and irritant to skin and damage to lungs. It will be used as the electrolyte for electrolyser stacks. It will be stored in a bunded area. Approximately $25m^3$ is required per 2.5MW of electrolyser capacity. $800m^3$ is required for the proposed hydrogen plant. Storage tanks of $200m^3$ will be required, as the lye can be reused as part of a closed system. Spills will be removed offsite and will not infiltrate the wastewater system.

16.6.12. Nitrogen gas will be used to purge equipment of air, oxygen and other oxidisers before introducing hydrogen. Nitrogen will be produced on site. While not toxic, it will require venting.

16.6.13. Oxygen will be produced as a byproduct. A maximum daily emission of 32,000kg of oxygen will be produced. It will be released via a vent stack of 5.5m. There are no plans to collect the oxygen.

16.6.14. Hydrogen will be compressed and transferred to buffers and onto the tube-trailer at filling points.

16.6.15. The hydrogen plant will be a Lower Tier COMAH site. It is subject to a range of regulations and safety standards. A Preliminary Hazard Analysis and an outline major

accident prevention policy has been included in Appendices 16.1 and 6.2 An Emergency Response Plan will be produced for the plant. A risk management programme, ATEX Assessment and Safety Management System will be required for the plant. Consultation has taken place with the HSA. A SCADA system will monitor the plant and fire fighting systems will be in paces, including alarms, water spray deluge systems, sprinkler systems, carbon dioxide suppression systems and mobile fire protection equipment. Two water storage tanks for fire fighting purposed of 636m^3, designed for 120 minute operation in event of a fire. The limited volume of hydrogen stored on sites mitigates accidents. Oxygen systems are separate from the hydrogen systems and stores of combustible materials.

16.6.16. A list of chemicals stored in the plant is provided. These will be stored in a bunded area, distant from water courses and will be subject to Regulation.

16.6.17. The annual water budget for the plant is 65,021m^3. This will be sourced from groundwater and rainwater harvesting. Total water available from these sources are 125,490m^3 per year. Underground water storage of 15,057.7m^3 will be provided, which could meet between 1 and 3 months' supply needs. A back up mains supply from Uisce Eireann will be provided, which has been confirmed as feasible.

16.6.18. When testing for groundwater, eight boreholes were drilled and two selected for testing (boreholes 6 and 7). A neighbouring well was monitored during this testing to see if the drawdown effected this well. This did not have any significant impact. A sustainable daily yield of 232m^3 per day can be achieved. However, rainwater harvesting will reduce this demand by up to 80%. The conservative estimate of water demand is 182m3 per day for the hydrogen plant.

16.6.19. The water treatment process is double pass Reverse Osmosis (RO) and Continuous Electrodeionisation (CEDI). The untreated water will go through the RO cartridge fillers to reduce suspended solids. This is subject to some chemical treatment, to prevent scaling of the equipment and then to remove chlorine residual. Feed or product water is then directed to RO units where it is stored and the reject flow is directed to a wastewater collection sump. Then it is fed to the CEDI units, which further reduce dissolved solids from the product water. Electric current passes the CEDI cells, to produce high purity demineralised water. Reject water is recycled to the RO feed. Between 8 to 25% of the water will be wastewater, which is then treated via

the constructed wetlands and discharged. The volumes will vary, depending on rainfall and wind, between 28.39 and 72.47m^3 per day.

16.6.20. The hydrogen process wastewater will be treated to 70% efficiency, so as that the mineral or chemical constituents per volume will be treated. It will pass through the process constructed wetland for 6 days.

16.6.21. If mains water is used as a source for water, it will require de-chlorination. This would involve treatment with sodium bisulphite; circa 2-5 mg/l. This low volume will not impact on aquatic life.

16.6.22. The wastewater tank can hold a minimum of a month's wastewater, prior to discharge to the constructed wetlands. Therefore, should any contaminants be found, the discharge can be halted.

16.6.23. Wastewater from the welfare facility will pass through a septic tank first, before passing through a separate welfare constructed wetland. This will be circa 80m^2 and will retain the wastewater for 12 days. This will then be passed to the wastewater treatment storage tank, which combined with the process wastewater will flow to the process constructed wetlands.

16.6.24. The wastewater that arises from chemical cleaning of the equipment (will includes citric acid and sodium hydroxide) will be collected in a tank and disposed of to a licenced facility. The chemicals will be stored in containers, in a bund and levels will be monitored for spills. The antiscalant used will be non-hazardous.

16.6.25. Fin fans will be used to cool the electrolysis process and to cool the hydrogen.

16.6.26. Two high pressure compressors will be used to compress the hydrogen from an outlet pressure of 30bar to a storage pressure of 500bar. These will generate noise and will be housed in an enclosure. Acoustic fencing can be added if necessary.

16.6.27. A buffer tank system has been incorporated to hold the hydrogen, before being dispensed to the tube-trailers. The tube-trailers will hold the hydrogen at 1,200kg at 380 bar. The transportation of hydrogen is covered under two directives of the Directive 2008/68/EC and Directive 2010/35/EU and the International Carriage of Dangerous Goods by Road (ADR). These have been transposed in Ireland under The European Communities (Carriage of Dangerous Goods by Road and Use of Transportable Pressure Equipment) Regulations 2011 to 2021, as amended. The

EIAR notes that the tube trailers have been designed to withstand impacts and can be monitored remotely.

16.6.28. Transformers will be required to step down the voltage of the electricity to 33kV.

16.6.29. For construction, the turbine delivery routes will require temporary works, be the route from Galway Port or Killybegs Port. If from Galway, works will be required around the Charlestown area and will include for temporary road widening, street furniture removal (including poles), tree pruning/removal and signage.

16.6.30. Works will be required irrespective of route on the local road network. These works include temporary widening works and associated accommodation works. Construction traffic will follow a one-way system.

16.6.31. The existing bog tracks will be upgraded within the wind farm location. There will be 2 no. watercourse crossings of the Brusna upgraded a new one provided. Ten drainage crossings, of which four are new, would have to be provided.

16.6.32. The wind farm substation will be an Air-Insulated Switchroom (AIS) (13,892m^2). A control room will provide for staff facilities. Welfare wastewater will be held in a sealed container to be tankered off site.

16.6.33. The felling of a mature, commercial forest will be required. This will be subject to a felling licence, which will require the afforestation of an equivalent area. This afforestation will take place more than 10km of the wind farm and outside the catchment area for the wind farm. The felling and afforestation will not take place until the appropriate licences are in place.

16.6.34. The route of the underground interconnector and grid connection is described. The methodology for cabling, joint bays, horizontal direction drilling and loop in interface mast is provided.

16.6.35. It is not anticipated that either rock breaking or rock blasting will be required.

16.6.36. Drainage measures will be utilised to attenuate runoff, prevent soil erosion, and maintain water quality.

16.6.37. The construction phase of the wind farm is anticipated to last 24 months. It will take place from 07:00 to 19:00 on weekdays and 08:00 to 13:00 on a Saturday, save for concrete pours. A Construction and Environmental Management Plan (CEMP) is

included. A Traffic Management Plan will be provided for the construction (average of 41 HGV trips per day). Circa 100-150 will be employed during construction works. The works will be monitored by a Geotechnical Engineer and Ecological Clerk of Works. Archaeological testing and monitoring will take place under licence during excavations. A water quality monitoring and watercourse plan form part of the CEMP. Living peat (acrotelm) will be treated separately from the lower level (catotelm), with the top level reused around turbine bases and the lower level as backfill.

16.6.38. The construction traffic for the hydrogen plant will be 8 to 10 loads per day.

16.6.39. Following construction works, an area of cutover bog, 10.6ha will be subject to a Biodiversity Enhancement and Management Plan (BEMP), southwest of the wind farm site.

16.6.40. During operation, the hydrogen plant will operational 24 hours a day, with personnel present on site. A detailed Emergency Response Plan will be prepared.

16.6.41. Decommissioning of the wind farm will take place 40 years after commissioning. The turbines and cables will be removed but the foundations and ducts will remain in place.

16.6.42. The community benefit fund will be managed by a working group that will represents neighbours (up to 2 km) and the community.

16.6.43. ***Inspector's Evaluation and Conclusions***

16.6.44. The non-inclusion of the demolition of the house and its replacement in the planning application is not relevant to the EIA process, as these have been considered in the EIAR. The location of passing bays are described.

16.6.45. The chapter is detailed and comprehensive. A Construction Environmental Management Plan (CEMP) is submitted as an appendix to the chapter, in Volume 4. The CEMP is supported by a range of management plans. These are an Emergency Response Plan, Water Quality, Surface Water, Peat and Spoil, Waste Management, Decommissioning and Traffic Management Plan. I have reviewed these and consider that the CEMP is of a high standard. The chapter is considered acceptable.

16.7. Alternatives Considered

Issues Raised

16.7.1. The necessity for a hydrogen plant in the absence of an existing market for the product.

16.7.2. Use of deep core geothermal energy instead of wind energy.

16.7.3. Use of sea water instead of groundwater.

16.7.4. Location of project should be in an industrial area.

16.7.5. Less likelihood of surplus wind energy when the North Connacht 110kV line is commissioned.

Summary of Chapter

16.7.6. The 'Do-Nothing' Scenario is considered. It is compared against the proposed development. It concludes that the significant positive benefits of the project outweighs the disamenities, which can be mitigated. Critical benefits are climate change mitigation, contribution to renewable energy targets, improved air quality and economic benefits.

16.7.7. Alternative wind farm locations were considered against the current location, which has an extant planning permission that has been subject to EIA [*Inspector's note – this permission has now withered*]. These locations are Kilcummin and Sheskin. These locations are considered to be either too visually sensitive, too proximate to housing or concerns from a peat depth and ecological impact. These sites were assessed in the original EIS prepared for the site. They remain unsuitable alternative locations.

16.7.8. Alternative Hydrogen Plant locations were considered. A series of constraints informed the site selection process, including proximity to the wind farm, the national road network and availability of water for production. Sites within the wind farm were dismissed due to the public being in the vicinity for turf cutting and the difficulty of road access, as raised by local residents. Other locations were more populous. A table (3.2) is provided to show how the alternative locations for the hydrogen plant fell away. The current location provides the best fit.

16.7.9. Alternative renewable energy technologies were considered for the wind farm location. Solar was considered. However, the land take required for an equivalent size solar

farm is in the region of 234 hectares, in comparison to a footprint of 30ha for the 13 no. turbines and infrastructure.

16.7.10. The provision of a wind farm only was considered. However, the benefits of hydrogen to climate change transition would be lost.

16.7.11. Various numbers of turbines and heights were considered. Fewer turbines at greater height are considered to be less impactful overall and generate more electricity.

16.7.12. The layout of the turbines went through a number of iterations of design development. Areas of constraints were identified first and then the 'developable' area was considered. The areas that were most sensitive were screened out. This included landholders not involved in the project. The intention was to use as much of the existing roads as possible.

16.7.13. After this more detailed considerations of a hydrological, geotechnical and performance nature informed the layout. The environmental impacts of the various options were evaluated.

16.7.14. For the hydrogen plant, the avoidance of the Sensitive Rural Landscape to the south as well as separation distances from dwellings. Different designs of the access route and the hydrogen plant were considered.

16.7.15. Alternative substations and grid connection routes were considered.

16.7.16. Alternative technologies to hydrogen were considered. The EIAR states that even when the North Connacht 110kV line is commissioned, there will still be a constraint of between 11% to 20% on the network. A Battery Energy Storage System (BESS) was considered at the wind farm location. However, the land take for the BESS is considerable at 1,320ha for equivalent storage. There is no guarantee that there would be capacity in the transmission network during times of high winds. Hydrogen, in comparison, can cope with this variability. Electrical Vehicle Fleet Charging was also considered, but not considered appropriate in the relatively isolated locality.

16.7.17. Different types of electrolyser technology were considered, but the more commercial proven technology was chosen.

16.7.18. Three forms of hydrogen storage and transport options were considered – compressed storage by way of the tube-trailers; liquefied storage and pipeline storage.

There is no pipeline infrastructure to Ballina and there are currently regulatory restrictions to injecting hydrogen into the gas network. The liquefication process involves cooling the gas via liquid nitrogen. This would require more space and entail higher risk as more hydrogen would be stored on site.

16.7.19. Different water sources were considered. These included water abstraction from the Glenree River, desalinated water, mains connection and groundwater with rainwater harvesting. Abstraction of water from the Glenree River was ruled out on environmental impacts. Desalination would increase traffic flows to the hydrogen plant. The use of mains water would have a neutral impact on the environment. The use of groundwater supplemented with rainwater harvesting would ensure that the aquifer could be managed sustainably, without impact on wells. Mains water was found to be too expensive and would require a contingency supply. Desalination would generate more vehicular movements and the groundwater supplemented with rainwater, with a back-up mains supply was considered the most suitable.

16.7.20. Options are considered in relation to the disposal of wastewater discharge. These are off site treat, following dilution with rainwater, recharge to groundwater and constructed wetland and discharge to a watercourse. There are risks to contamination of the aquifer, so this is not a realistic option. Tankering off site will increase the number of vehicles using the site and add to costs.

16.7.21. ***Inspector's Evaluation and Conclusion***

16.7.22. The environmental considerations which informed the choice between the alternatives is apparent in the chapter. The alternatives examined are reasonable. The use of deep core geothermal energy as a source of electricity, as suggested by an observer, was not considered. I do not consider that deep core geothermal energy is a reasonable alternative when the project concerns wind energy and surplus electricity that would otherwise be lost to the grid.

16.7.23. Mayo County Council queried whether the alternatives had been fully explored. They are of the view that the hydrogen plant would be more appropriately located adjacent to a large industrial plant, seeking to decarbonise their production. The hydrogen plant does not require to be proximate to the wind farm. I consider that the likely main end users of hydrogen in this instance is the transport sector, rather than

industrial application. Transport users are dispersed nationally. I would accept that proximity to the source of the renewable energy is more relevant in this instance.

16.7.24. Many observers questioned the need for the hydrogen plant, given the safety implications of the plant and the transport of hydrogen by road. Since the submission of the application, the North Connacht 110kV line has been permitted. This will increase the capacity of the transmission network in the northwest and so there is less likelihood of wind farms being curtailed in their contribution to the grid. The EIAR states that even with this increased transmission capacity, there still be curtailment and the hydrogen plant means that surplus renewable energy is not lost. The alternative BESS system would require significantly more land to provide.

16.7.25. I consider that hydrogen fuel, to provide a fuel for the transport of heavy goods or the travelling public, is needed to decarbonise the transport sector. The generation of hydrogen gas is consistent with Climate Change strategy, particularly so when the source is from a renewable form of electricity. Therefore, while the wind farm might be granted planning permission as a standalone entity, the synergy of the two projects is lost. Please see market information on hydrogen demand in the next section.

16.7.26. The choice of groundwater as a source of water for the project is one of concern for many of the observers. Concerns arise about the long term sustainability of the supply, the potential for depletion of the groundwater source and wells running dry and the potential for increased saline intrusion in groundwater. I note that while 50% to 80% of the water supply is due to come from rainwater harvesting, the volume of groundwater to be extracted is conservatively expected to be of the order of 32,500 cubic metres. Seawater would require to be collected and desalinated before use. Any desalination unit would require space, require energy and additional storage would be needed for the seawater and the disposal of concentrate. There would be additional vehicles required and parking for these. I am satisfied that desalination is not a realistic option in this project.

16.7.27. I consider the reasonable alternatives have been adequately considered from an environmental perspective.

16.8. Population and Human Health

Issues Raised

16.8.1. The proposed hydrogen plant is too proximate to housing, given the risk of explosion.

16.8.2. Property prices will be devalued.

16.8.3. No additional housing will be permitted proximate to the proposed hydrogen plant.

16.8.4. Lack of safety regulations for hydrogen workers.

16.8.5. Enniscrone should have been included in the population statistics.

16.8.6. Very little employment will arise.

16.8.7. There will be a significant impact on tourism, particularly in relation to the Eurovelo Route.

Competency of the authors

16.8.8. I am satisfied that this chapter has been prepared by persons with sufficient competency in the field.

Context

16.8.9. The relevant legislation and guidance that informs the chapter is set out. I draw attention to the Health and Safety Regulations, the SEVESO Directive and Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015.

16.8.10. The EU 2017 Guidance on EIAR states that health effects, such as those caused by the release of toxic substances to the environment and the health risks arising from major hazards associated with the project should be considered in the EIAR. These are considered in this chapter.

16.8.11. An EPA survey in 2022 found that 84% of the Irish population is either concerned or alarmed about climate change and indicates that this is now a mainstream issue. The need to reduce the use of energy arising from higher costs since the Russian invasion of the Ukraine has affected some 77% of the population and the ESRI in 2022 found that 43% of households could now be in energy poverty.

16.8.12. Scoping included consultation with a range of organisations. Only the HSE responded.

Baseline

16.8.13. In relation to local population issues, the study area population has increased by circa 7% since the last census to 3,506 persons. Bonniconlan is the nearest village, 4km southwest of the wind farm. Ballina is the main town, with a population of 10,171, some 12km from the wind farm site and 5.5.km southeast of the hydrogen plant. The local population density is 15.16 persons per square kilometre, compared to 23 persons per square kilometre for County Mayo and 35.7 persons per square kilometre in County Sligo.

16.8.14. The primary economic sectors in the study area are agriculture and commercial forestry. However, only 15% of the population work in these areas. Some 147 persons work in the building and construction and transport industries that could benefit from the proposed development.

16.8.15. Mayo in 2020 had 25 windfarms, producing 266MW of renewable energy and contributing 6% of overall energy production in Ireland.

16.8.16. Studies by the European Environment Agency have shown that the reduction in use of fossil fuels has improved air quality and health outcomes. In Ireland, in 2016, 30 deaths were attributed to Ozone and 1,300 to fine particulate matter in 2020.

16.8.17. Electromagnetic fields (EMF) are created in all electrical equipment and power lines. These decrease by distance and by the presence of building materials. The population is exposed to EMF on a daily basis. Underground cables do not impact on health. The International Commission on Non-Ionising Radiation Protection have a limit of 100μT for sources of AC magnetic fields. A 110kV underground cable has 0.13μT directly above it. Turbines operating at high wind scenarios have fields of between 0.02 and 0.41μT.

Potential Direct Impacts

16.8.18. The area surrounding the wind farm and hydrogen plants are sparsely populated.

16.8.19. In relation to the wind farms, impacts on property prices are unclear with studies in the UK finding contradictory results of either a 5 to 6% reduction in value within 2 km of large wind farms with other studies finding no significant effect or a positive

effect. The hydrogen plant location is in Eircode Routing Key F26, where the median property price was €180,000 in 2022. The national median property price is €305,000.

16.8.20. Studies on the impact of wind farms on human health were reviewed by the National Health and Medical Research Council of Australia in 2013. No direct evidence was found that wind farms have an impact on human health. Noise and shadow flicker will be considered separately.

16.8.21. The improvement in air quality by the reduction in use of fossil fuels will have a direct health benefit.

16.8.22. There will be an increase in expenditure the local economy arising from the construction phase, with some local suppliers being used to source materials. The overall spend of the project will be mostly realised in the national economy. By 2030, it is estimated that circa 7,000 persons will be employed in this sector.

16.8.23. There are significant savings for the state in terms of the wholesale electricity market arising from wind energy generation (estimated to be €2.3bn from 2000-2020).

16.8.24. The green hydrogen market in Europe is stated to worth $283.2 million USD. By 2030, it is estimated that there will be up to 1 million jobs created by it. In Ireland, this is estimated to between 80-600 jobs directly and 170-1,200 indirectly. It is estimated that the proposed development will create 26 new, long term jobs. During construction, there will be 150 employed at the peak of construction.

16.8.25. Energy security will increase, with a reduction in the demand for fossil fuels.

16.8.26. There will be direct benefits to the local community from the community benefit fund. Should local residents and business decide to use the fuel, a fixed discounted price will be available for 15 years.

16.8.27. Direct impacts on tourism are likely to be slight and negative during construction and decommissioning and slight and positive when in operation. There will be improved access around the wind farm and international information shows that renewal energy projects are viewed positively by visitors.

16.8.28. Shadow flicker was assessed using the various hub heights and rotor diameter. The worst case scenario showed the occupied house, H3 would experience 19 hours and 10 minutes of shadow flicker. Potentially between 29 and 32 dwellings out if 46 could be affected.

16.8.29. There will be impacts on residential amenity during construction, from construction traffic. Impacts during operation from noise, interference with telecommunications can be mitigated and will be discussed under the relevant chapter heading, to avoid repetition.

Potential Indirect Impacts

16.8.30. An indirect improvement in air quality will arise from the reduction in use of fossil fuels.

16.8.31. Indirect employment will be created to service both the proposed development and in the wider economy.

Main Mitigation Measures

16.8.32. The CEMP provided with the application will be adhered to. This includes noise, dust, traffic management, emergency response to spills etc.

16.8.33. During operation, the relevant turbine will be curtailed to prevent shadow flicker.

Potential Residual Impacts

16.8.34. There will not be a residual effect on noise after mitigation.

Potential Cumulative Impacts

16.8.35. The Carrowleagh Wind Farm and its extension is to the east and northeast of the wind farm location. It comprises of 17 no. Enercon E70/2300 turbines. Planning permission has been granted for Stokane, which is a community led wind turbine of 150m^2, circa a kilometre north of the wind farm location. Black Lough Wind farm is 2.4km to the east and Bunnyconnellan Wind farm is 5km to the south.

Inspector's Evaluation and Conclusions

16.8.36. Observers are concerned that there are no regulations relating to the safety of the hydrogen plant and workers therein. However, this is not the case, as described above.

16.8.37. The issue of property devaluation was of significant concern to observers at the oral hearing. Many saw their homes as their final significant investment that would support them in later years. Others were concerned that family members would not be able to build in the vicinity of the hydrogen plant if it was permitted. Mr. Lipston from RSK at the Oral Hearing confirmed that the consultation distance for the HSA would

not give rise to a recommendation from the HSA not to grant permission. In relation to property values, I note that the auctioneer for the third parties consider that these will fall. I consider that any fall in property value, is likely to be of a short-term nature, generally corresponding to the construction period. I am satisfied that property values will reflect the wider property market following this period.

16.8.38. The impact on the Euro Velo Route was of concern to observers and it received little attention in the EIAR. I would concur that there will be a short term negative impact on the route during construction. However, given the length of the route, I consider the effects limited and that there will be no long terms impacts on the route.

16.8.39. Observers are concerned that Enniscrone is not included in the Study Area. I am satisfied that Enniscrone is sufficiently removed from the site not to be significantly impacted by the effects of the development.

16.8.40. I would concur with the conclusion that the project will have a slight, positive impact on populations and human health, albeit after temporary negative impacts during the construction phase. The use of hydrogen as a replacement for fossil fuel will bring indirect positive impacts. The proximity of the proposed hydrogen plant to housing and the risk of explosion will be discussed in Section 16.20.

16.9. **Terrestrial Ecology**

Issues Raised

16.9.1. An independent review of ecology is requested.

16.9.2. The location of the proposed hydrogen plant has not been adequately surveyed for bat use.

16.9.3. The concentration of wind turbines in the area would create a barrier and displace bats.

Competency of the authors

16.9.4. I am satisfied with the competency of the authors.

Context

16.9.5. The chapter sets out the legislation and guidance that has informed it.

Baseline

16.9.6. Badgers, otters and bats are considered, as well as habitats and flora species. Individual Zone of Influence relating to the relevant Key Ecological Receptors have been prepared for direct impacts, construction effects and potential impacts on surface water quality. Field studies have been undertaken since 2022 to 2023.

16.9.7. In relation to bats, bat activity surveys, static detector surveys and preliminary roost surveys have been carried out. These adhere to Scottish Natural Heritage Guidelines. Bat surveys were carried out in 2021, during spring, summer and autumn at the wind farm location. A bat roost assessment has been carried out for the hydrogen plant location.

16.9.8. The wind farm location is primarily Cutover Blanket Bog. Some uncut Lowland Bog remains. Wet heath has developed over undisturbed cutover bog. There is some scrub, a conifer plantation and wet grassland. There are areas of intact blanket bog (some 72.5ha) and these correspond to Annex I habitat. The remanent high bog is rated as County Importance.

16.9.9. There are 6 no. European designated sites and 15 no. proposed Natural Heritage Areas. The Ox Mountains SAC is circa 100m from the wind farm location and there is an ecological and hydrological connection between the two. The Killala Bay / Moy Estuary SAC and SPA are hydrologically linked to both the wind farm and hydrogen plant locations. There is a hydrological connection to the River Moy SAC and Easkey River pNHA and the wind farm.

16.9.10. The hydrogen plant location is generally improved grasslands and treelines. The area is rated as Local Importance (Lower Value).

16.9.11. No invasive species were found on either site. No protected flora was found.

16.9.12. The grid connection route is located generally on roads with roadside hedgerows and some improved grasslands. The interconnector route is similar, but with some wet grassland, conifer plantations and remanent cutover bog. The rating level is Local Importance (Lower Value).

16.9.13. The turbine delivery route is on main roads until reaching the turnoff of the N59.

16.9.14. The wind farm location is used by the protected species, Irish Hare, fox and deer. The pygmy shrew is expected to use the site. No evidence of badger was found.

No otter was found. Frog is widespread. The common lizard was observed twice. The protected mammals are listed as species of 'Least Concern' on the Irish Red List.

16.9.15. At the hydrogen plant location, the Dooyeaghny Stream, is in a canalised cut, circa 2 metres below the bank. It is circa 1.5 metres wide with a depth of between 30-40 cm., with a gravel base. Brown trout, Stickleback, Minnow and European Eel could be supported in the stream. Downstream, there is some potential for salmon spawning in the riffle habitat. No evidence of otter was found but it may use this route for commuting.

16.9.16. The proposed turbines are to be located in an area of low bat importance. The Soprano Pipistrelle bat is considered more likely to avail of this landscape. This was confirmed in the bat activity surveys. Three other bats that use the location are the Common Pipistrelle, Leisler's Bat and a Brown Long Eared bat. The bat static detector survey found eight species using the location. Some 8,000 recordings were found in 2021. The greatest number of passes were near Turbines 1 and 2, near the conifer plantation. No bat roosts were found on the wind farm location and the hydrogen plant.

Potential Direct Impacts

16.9.17. The proposed wind farm would give rise to permanent loss of habitat (circa 18.5ha), temporary loss of cutover bog and disturbance to habitats. There will be limited tree loss on the turbine delivery route. The affected habitat mostly consists of cutover bog (15.23ha), with 0.49ha high bog. The high bogs are at T3 and T9. However, these areas are remnants surrounded by cutover bog and are drying at the margins. The loss of the cutover bog is described as of moderate significance. It represents circa 4% of the total cutover bog at the wind farm location. It will be offset in part by the BEMP area.

16.9.18. The temporary loss of cutover bog (8.93ha) arises from the need to store excavated peat and soil on site. When complete, the surface will be capped with a peat layer and saved surface vegetation will be spread across it to encourage the regeneration of bog vegetation. In the long term, the effects will be neutral.

16.9.19. Disturbance to habitat will arise to the areas of bog adjoining the works area, including the construction of the on-site drainage system. However, the impact is considered slight adverse of a short-term duration.

16.9.20. The drying of the edge of the areas of high bog, which may extend to 10m, is considered moderate adverse effect of medium-term duration.

16.9.21. The impact on mammals arising from the loss of cutover bog is considered not significant. There would be disturbance to deer during construction, but this is localised and temporary. Mitigation measures will be implemented for frogs and lizards. The effects will be slight adverse.

16.9.22. Leisler's Bat had the highest numbers of recordings of bat passes on the wind farm location (3,284 passes out of 8,080). Ireland is described as the global stronghold for Leisler's Bats. The Soprano Pipistrelle had 2,137 passes and the Common Pipistrelle had 1,825 passes. These three bats are identified at high risk of collision with wind turbines.

16.9.23. Trees will be felled to ensure that a buffer of 85 metres between blade tip and trees will be maintained. Blades will not rotate significantly below cut in speeds (feathering) and curtailment will be implemented when conditions are suitable for bat activity. Feathering can reduce bat mortality by 90% and curtailment by 50%. Increased cut-in speeds will operate for all turbines, (save for T4 and T10), which pose a medium risk to bats. Cut-in speeds will be increased from the 1st of April to 30th October when temperatures are above 11 degrees and wind speeds are at or below 5 m/s for 30 minutes prior to sunset and 30 minutes after sunrise.

16.9.24. Should there be a major accident on the hydrogen plant location, there could be significant environmental impacts on the Dooyeaghny River and Killala Bay/ Moy Estuary SAC and SPA. There are potential Significant Adverse effects on the designated sites, otters and salmon spawning sites.

16.9.25. Decommissioning of the wind farm will be undertaken in accordance with a plan. This will minimise disturbance to habitats and protected species. No adverse effects are anticipated. Baseline studies will be undertaken in advance.

16.9.26. The areas of the BEMP (10.6 ha) will be preserved and rehabilitated. This will provide enhanced habitat for red grouse, meadow pipit (both red-listed), skylark, common frog and common lizard.

Potential Indirect Impacts

16.9.27. Indirect impacts may arise on otters, should surface water quality deteriorate from suspended solids.

Mitigation Measures

16.9.28. Aside from design, the main mitigation measures include the engagement of an Ecological Clerk of Works to implement the CEMP, avoiding sediment and other substances entering the surface water system, ensuring adequate distance between the blades and forestry and bat friendly lighting. At the Oral Hearing, the curtailment of the turbines nearest to the treeline was discussed, at times of dusk, when bats would be emerging to forage for food.

Potential Residual Impacts

16.9.29. Post construction habitat and bat monitoring will be carried out, to detect any significant changes occur. Fatality searches will be carried out. The EIAR states that it is considered that the proposed development will not have a long term negative effect on the local bat population.

Potential Cumulative Impacts

16.9.30. There has been a loss of cutover bog with most of the wind farms in the vicinity being located on peat and the proposed development will contribute to it. The loss of intact high bog is stated as minimal.

Inspector's Evaluation and Conclusions

16.9.31. I note that the observers have questioned the methodology used and I requested that Dr. Maeve Flynn, the Inspectorate Ecologist, to review this and other chapters (aquatic ecology and ornithology); the AA Screening Report and NIS. I refer to her report in Appendix 1, the findings of which I concur with.

16.9.32. The chapter is well researched. I note that there will be a permanent loss of peatland habitat of 15.23 ha, which is described as moderate adverse. Given the extent of cutover bog in the area, and the right for persons to continue to cut turf, I concur with this assessment. The proposed Biodiversity Enhancement Management Area at 10.6ha is less than the area that would be permanently lost, is not ideal. However, there will be no turf cutting in this area. Dr. Flynn considers that the Biodiversity Enhancement Management Area is the only area where the applicant can

contribute positively to biodiversity and that the conclusion of residual moderate adverse effect on peatland habitat is appropriate.

16.9.33. I had concerns in relation to the species of bat use of the wind farm site, as the species that use the site are particularly important and particularly vulnerable to collision. At the Oral Hearing, this matter was addressed and the use of curtailment to prevent negative impacts on bats can be conditioned.

16.9.34. Dr. Flynn considers that the wind farm landscape, save for the area around the forestry edge, is of low importance to bats. She is satisfied with the methodology employed, both at the wind farm location and the hydrogen plant location. She considers that the turbines are located a distance to allow an adequate buffer. The mitigation measures proposed are considered best practice.

16.9.35. I am satisfied that the mitigation measures can be conditioned to ensure that bat loss is minimised. In relation to the difference in turbine height and blade radius, the lower nacelle height with the longest blade would have the lowest air gap between the blade tip and the ground of 25m. The higher nacelle and blade tip would provide an air gap of 36m. I am satisfied that the turbines are located with a buffer of 85m from forestry in the vicinity and therefore irrespective of the finalised design, would have an adequate setback. The offer of curtailment of the turbines nearest the tree line at times of bat activity can be included in a grant of planning permission, should the Board decide to grant planning permission.

16.9.36. Observers are concerned that the turbines, in conjunction to those already existing would form a block which could displace bats from foraging areas. Dr. Flynn considers that bat activity is likely to be widespread but patchy in the wider landscape. I note that the adjoining existing wind farm is located in an area with limited foraging opportunities. The proposed wind farm site is broadly similar, save for close to the treeline. Therefore, I do not consider that a large block of area will no longer be available to bats for foraging as a result of this proposed development.

16.9.37. I am satisfied that that given the baseline habitat of the wind farm location, with limited hedgerows and treelines, and the proposed vegetation-free buffer zones around the turbines, that there will not be a significant negative impact on terrestrial ecology.

16.10. Aquatic Ecology

Issues Raised

16.10.1. Significant impacts on the streams on site and off-site, arising from release of sedimentation from earth movements. This would effect the Fresh Water Pearl Mussel, Salmon, Trout and other aquatic life.

16.10.2. Indirect impacts would arise from the smothering of spawning grounds, reduction in prey.

16.10.3. Loss of water supply to surface water, due to groundwater depletion and indirect impacts on aquatic ecosystems.

16.10.4. Insufficient volume of surface water to dilute the discharge from the proposed hydrogen plant, which would give rise to a threat of pollution. The data from which the capacity of the stream is not robust to be reliable.

16.10.5. The discharge from the plant may not be sufficiently diluted prior to release to the stream.

16.10.6. Pollution risk from the potential of chemicals used in the proposed hydrogen plant arising from spills.

16.10.7. The current programme to rehabilitate the Dooyeaghny Stream for fisheries would be undermined.

16.10.8. Inadequate assessment of the Dooyeaghny Stream as electrofishing was not carried out.

Competency of the authors

16.10.9. I am satisfied with the competency of the authors.

Context

16.10.10. The chapter sets out the legislation and guidance that has informed it. Consultations with the NPWS, which included in relation to the Freshwater Pearl Mussel and with the IFI took place. A licence was obtained for electro-fishing from the IFI.

Baseline

16.10.11. A potential Zone of Influence at the locations and 500 metres downstream and surveys of the watercourse were undertaken in September 2021. Three streams that drain the wind farm location were electro-fished. Salmonids, lamprey and eel were the main species targeted.

16.10.12. The Owencam River (S1) is in the south of the site and is a tributary to the River Brusna, which then joins with the Glenree River and onto the River Moy, which is an SAC, at its tidal section. The Brusna River is an important fishery for salmon and trout fishery and supports lamprey, which are listed in Annex II of the Habitats Directive. The Moy SAC includes the Brusna /Glenree River to as far as 6 km from the site. However, the tributary to the Owencam which rises within the wind farm location is very small and of low fisheries value. Only when other tributaries join does the stream become valuable for spawning and nursery habitat. The same applies to the Glenree River Tributary (S2), which also rises on the site. Juvenile trout were found in both rivers.

16.10.13. A small tributary stream rises in the northeast of the wind farm location and joins the Gowlan River some 4 km to the north, which 3 km later joins the Easkey River. This river is important for salmon and Freshwater Pearl Mussel (FWPM), of national importance. However, the stream on site (S3) is stated to have no salmonoid value and no potential for FWPM.

16.10.14. The Dooyeaghny River rises close to the hydrogen plant location. It has potential to support Brown Trout, Stickleback, Minnow and the European Eel, but not salmonid species at this location. Downstream past the N59, there is potential for spawning for salmonoids.

16.10.15. S1 has a Q Value of 4, which is of Good WFD Ecological Status. S2 has a Q Value of 3-4, which is of Moderate WFD Ecological Status. S3 was not suitable for Biotic Index testing, but the apparent quality is considered good, due to lack of pollution sources.

16.10.16. The FPM some 3.5 km downstream of the wind farm location via S3 are Annex II and are critically endangered. They are of international importance.

Potential Direct Impacts

16.10.17. During construction, the works, including clearance, tree felling, excavation, fill, drainage works etc. could give rise to sediment, nutrient and pollution release to receiving waters. This would result in the degradation of surface waters, which would impact on aquatic life. Increased silt loads could effect salmon spawning and on FPM downstream, in the absence of mitigation measures. The effects could be moderately to profound and of a temporary to long term nature. Aquatic invertebrate communities and aquatic macrophytes can also be effected.

16.10.18. The three crossings of the head water streams of the Owencam River take place in areas where fishery is limited. There are existing culverts and will require extension or upgrading. There will be an impact on aquatic and riparian habitat and could interfere with fish movement. This is stated to be a minor negative impact at a local level.

16.10.19. At the hydrogen plant site, there is potential for sediment to enter the Dooyeaghny Stream. The installation of the concrete outfall could impact on the watercourse and further downstream.

16.10.20. Peat failure could occur, but this is considered unlikely.

16.10.21. During operation of the wind farm, the risk to watercourses at the wind farm location is considered slight, arising from accidental spillage or inappropriate disposal. However, given the buffer distances to watercourses, this is considered unlikely.

16.10.22. During operation of the hydrogen plant, without mitigation measures, there is risk of significant deterioration of water quality in the watercourse and downstream European sites. This risk arises from chemicals and wastewater discharge. This risk is categorised as medium term significant adverse impacts.

16.10.23. During decommissioning of the wind farm, the scale of risk is considered to be much less.

16.10.24. A contingency plan has been prepared in the event of peat failure.

Potential Indirect Impacts

16.10.25. The grid connection requires four river crossings by way of HDD. Four more watercourse crossings will be required along the interconnector route, with only one

requiring HDD. There is a risk of indirect effects on water quality and aquatic life, due to silt run-off or accidental spillage of hydrocarbons.

Mitigation Measures

16.10.26. Mitigation measures are embedded in the design, construction, operation and decommissioning stages. Surface water management is key. The use of Sustainable Drainage Systems (SuDS) measures will intercept sedimentation, allow settlement and from this, treated water will be release by diffuse overland flow. Construction areas will be bypassed by clean water, reducing the need for water to be treated. De-watering will be filtered, prior to discharge. The installation of culverts for water crossings will take place during dry conditions between July and September. All roadside drains in the temporary works area will be culverted and check dams inserted upstream and downstream of the culverts. Silt fences with straw bales will also be used. Monitoring of the water quality will take place on a daily basis for settlement ponds. Chemical analysis of water quality will take place on monthly basis.

16.10.27. The wastewater from the hydrogen plant will treated to ensure that pollutants do not enter the Dooyeaghny Stream. The pre-cast discharge pipe will be installed during dry conditions between July and September.

16.10.28. At the Oral Hearing, the applicant confirmed that they would work with the IFI and would accept conditions in relation to the requirements of IFI.

Potential Residual Impacts

16.10.29. Other than the direct loss of habitat by the culverting of the river crossings, no negative residual impacts are expected from the wind farm.

16.10.30. The hydrogen plant in operation will require on-going monitoring and active management, to ensure that source water and wastewater is in compliance with the discharge licence.

Potential Cumulative Impacts

16.10.31. No cumulative impacts are referred to. However, at the oral hearing, a worst case analysis submission was prepared and a negligible residual impact is expected.

Inspector's Evaluation and Conclusions

16.10.32. Observers and the IFI are very concerned about sedimentation, the quality of the discharge from the hydrogen plant, the volume of the receiving waters and whether the spring downstream of the hydrogen plant would be affected due to groundwater pumping. Dr. Flynn considers that the mitigation measures are designed around preventing deterioration of water quality and that the applicant has addressed concerns adequately. She concurs with the overall conclusion that of negligible residual impacts with the full implementation of mitigation measures and monitoring. I am satisfied that the measures in the CEMP will prevent sedimentation from impacting on aquatic life. In operation, the discharge from the hydrogen plant will be sufficiently diluted to avoid deterioration of water quality in the Dooyeaghny Stream. The assimilative capacity of the stream has been questioned. However, the telemetry information on the stream and storage capacity for the discharge is sufficient to ensure that in low flows, the discharge can be held back until flow rates improve. The main question then is if there is a reduction in flow from groundwater pumping to the tributary to the south of the site. The applicant has stated that this tributary would be monitored and that groundwater pumping would cease if the stream falls below an agreed trigger level. This can be conditioned.

16.10.33. Significant consideration has been given to the potential impact on the very sensitive receiving waters and should mitigation measures be adhered to, I am satisfied that the proposed development will not impact on surface waters or fish life.

16.11. **Ornithology**

Issues Raised

16.11.1. Adequacy of the methodology used.

16.11.2. Collision risk of birds flying from the SPA sites when foraging and potential displacement.

Competency of the authors

16.11.3. I am satisfied that this chapter has been prepared by persons with sufficient competency in the field.

Context

16.11.4. The relevant legislation and guidance that informs the chapter is set out. The location of the hydrogen plant, the grid connection route and the interconnector route will not have a significant effect on ornithology, so the focus is on the wind farm location.

Baseline

16.11.5. Two years of studies have been carried out, from 2019 to 2021. The vantage point studies were carried out in two, 3 hour session every month. Breeding and winter bird transect surveys were carried out in each season. Merlin has been recorded breeding on site and surveys for this and breeding woodcock surveys were undertaken. A red grouse survey was undertaken. Hinterland surveys that could cross the wind farm site were undertaken. These were focussed on Lough Talt, Easkey Lough, Letterunshun and Bunnyconnellan.

16.11.6. The Kestrel was observed on 4 occasions, but not evidence of nesting was found. The sparrowhawk, Merlin and Peregrine were observed on single occasions.

16.11.7. In the winter period, Kestrel were recorded on three occasions, hunting. Four records of Gloden Plover, consisting of between 2 and 21 birds, were observed. On one occasion, they landed on the bog.

16.11.8. Meadow pipit (red list) and skylark (amber list) breed on the bog habitats. The Cuckoo, swallows and starlings frequent the site.

16.11.9. No evidence of Merlin or Woodcock breeding on the site was found. Red Grouse was found, at a density of 0.75 red grouse per square kilometre.

16.11.10. In terms of the two loughs in the vicinity, a diversity of wintering birds were found. The Lertterunshun vantage point found sparrowhawk, kestrel and red grouse. The Ballyconnellan found similar, but less numerous.

16.11.11. The surveys found that the Kestrel’s use of the site is indicative of a breed territory circa 1-2km from the wind farm location. It is likely to be still Merlin breeding territory. Red grouse are resident on, at a density of 0.75 individuals per square kilometre. This is consistent with West Connacht levels. There is no evidence of Golden Plover breeding on site. Snipe and Meadow pipit, which are on the red list, are

present on site. Other amber listed birds may breed on the site or in the conifer plantations.

16.11.12. Three breeding pairs of red grouse are resident on the wind farm site. Circa 2 pairs of Snipes breed. Meadow pipit breeds on site. The wind farm location is categorised as being of County Importance for birds on the bog habitat and of local importance in the afforested area.

16.11.13. There are two Snipe breeding locations (near T13 and T10). These have been recorded in low numbers, circa two pairs.

Potential Direct Impacts

16.11.14. The habitat loss of bog at circa 3.5% is considered a moderate adverse effect of permanent duration. The loss of conifer is considered not significant. The loss of the treeline around the hydrogen plant will effect a local rookery. The loss of the treeline and agricultural sheds is considered an adverse effect of slight significance.

16.11.15. It is likely that the Red Grouse will be disturbed during construction and this is categorised as an adverse effect of short duration. Mitigation will be undertaken, including fencing off areas where breeding is taking places, from March to August. The same applies to Merlin and snipe.

16.11.16. The agricultural sheds on the hydrogen plant to be demolished may support nesting swallows and starlings, which are on the amber list. These will be demolished outside of the breeding season. Any pruning required for the turbine route will also be completed out of season.

16.11.17. Construction works may have potential disturbance effects up to 400m from the works, which would be an adverse effect of short term duration on the two Snipe breeding locations.

16.11.18. During operation, collision, displacement and barrier effects may arise. Collision risk modelling was carried out at the assessment envelope of 20m to 180m, for Kestrel, Peregrine and Golden Plover. Collision risk is not significant for Peregrine and Kestrel. Golden Plover has a risk of once in 6 years. This is categorised as Not Significant.

16.11.19. Displacement is not significant for Merlin, that hunt and breed close to ground levels. Kestrel have a low sensitivity for displacement, so the effect is not considered

significant. The effect on Snipe, Red Grouse and Golden Plover is categorised as not significant.

16.11.20. No barrier effect is likely as the wind farm location does not appear to be on a migration route.

Potential Indirect Impacts

16.11.21. No indirect effects are anticipated on birds in the hinterland of the site.

Mitigation Measures

16.11.22. The provision of the Biodiversity Enhancement and Management Plan to enhance blanket bog will benefit bird species associated with peatland. Specific mitigation will be in place if bird nests for Red Grouse, Merlin and Snipe are found to restrict works if necessary. Removal of vegetation will be carried out during the breeding season only after the area has been checked for nests.

16.11.23. Post construction bird monitoring will take place, including Vantage Point, distribution and abundance and collision searches.

Potential Residual Impacts

16.11.24. The BEMP will ensure that bird species associated with peatland habitats will benefit. Post construction monitoring will be undertaken to assess bird usage of the wind farm location. Residual impacts are categorised as imperceptible to slight.

Potential Cumulative Impacts

16.11.25. All the projects in the area of a 20km radius, comprising of 65 turbines have been individually assessed for impacts on birds. This includes the Carrowleagh Wind Farm to the east and north of the wind farm location and the Bonniconlon Wind Farm to the south. All support breeding Red Grouse and snipe and provide hunting grounds for Kestrel.

16.11.26. The potential for a barrier effect has been considered. Birds may avoid the areas between turbines, but a barrier effect is not considered likely as the area is not a migratory route for birds.

Inspector's Evaluation and Conclusions

16.11.27. I am informed by the Board's Ecologist report on this matter, appended to this report. Dr. Flynn considered that issues in relation to ornithology are based on

knowledge of the site over multiple years of bird survey. The surveys are considered proportionate to the habitat and bird species present. She does not consider that the proposed development would result in significant impacts on birds. I concur with this finding.

16.11.28. Observers were concerned about the methodology employed by the applicant in relation to birds, bats and aquatic sampling. Dr. Flynn is satisfied with the ecological surveys, which she states were undertaken in line with best practice methods and in the appropriate seasonal period. She is satisfied with the collision risk modelling undertaken and its findings. I concur that the chapter is satisfactory.

16.12. Soils and Geology

Issues Raised

16.12.1. Risk of sedimentation entering water courses.

16.12.2. Impact on turbary plots, particularly from spoil deposition.

16.12.3. Continuation of peat cutting during operation.

16.12.4. Transport of peat from the windfarm location to fill ground levels at the hydrogen plant location.

Competency of the authors

16.12.5. I am satisfied with the competency of the authors.

Context

16.12.6. The chapter sets out the relevant legislation and guidance that has informed the contents. The methodology included a peat slope stability assessment.

Baseline

16.12.7. The bedrock geology is the Ballina Limestone Formation (Lower), which is dark fine grained limestone and shale. The bedrock is considered medium to extremely strong. Soil type is peat bog (blanket peat), but it has been extensively drained and impacted by agricultural practices. Peat depth varies between 0 to 4.4 metres. The risk assessment for the turbine locations is low, save in relation T2 and T13 due to proximity to rivers. Slope stability is not considered a significant risk at the hydrogen plant site.

Potential Direct Impacts

16.12.8. The quality of the soil and bedrock is considered to be of Low to Medium Importance and Sensitivity in the wind farm location. While the area of the site is 445ha, the footprint is 27.55ha – circa 6%. Spoil disposition areas will be located near to T2, T12 and east of T4 (See Figure 8.8b). Peat depths are 2 metres for T2 and T12 and 1 metre for T4. The locations are 50 metres from streams and 25 metres from watercourses.

16.12.9. The construction phase will require the installation of surface water protection and monitoring before other preparation works. The foundations will be constructed next, then the installation of structures followed by backfilling. Compaction effects are considered slight to moderate, permanent adverse. Erosion of exposed soils are considered moderate to large, permanent and adverse. Soil sealing will increase run-off and will be slight to moderate permanent and adverse. There will be slight localised adverse effect on land take, but this is reversible.

16.12.10. The clearance of 2.9ha of forestry will lead to a slight increase in nitrate, dissolved organic carbon and potassium in receiving waters, which is negative. However, the forest will require felling at some point in time.

16.12.11. Stockpiling will have a negative, small to profound impact in a localised area. It may have a reversible impact on surface waters.

16.12.12. Spillages are a pollutant risk, arising from the refuelling of machinery. The impacts would be moderate to significant, permanent and localised. There could be a leak during HDD, so a particular lubricant is recommended – Clearbone, which breaks down and is not toxic in aquatic environments. Drilling mud can be transported off site to an approved facility.

16.12.13. Spillage of concrete and other accidental could arise and would be adverse, slight to significant.

16.12.14. The excavation of subsoil and bedrock at the hydrogen plant is large in scale adverse impact.

16.12.15. During operation, the storage of chemicals is a risk at the hydrogen plant. If a major hazard event arose, the impacts would significant long term adverse effect but that would be localised and reversible.

Potential Indirect Impacts

16.12.16. Indirect impacts relate to the impacts on receiving waters.

Mitigation Measures

16.12.17. Peat management to avoid the erosion and degradation of soils and reduce runoff will be implemented. Construction activities will not occur during sustained rainfall events. A geotechnical engineer or geologist will supervise excavation works. A CEMP and Surface Water Management Plan has been submitted with the application.

Potential Residual Impacts

16.12.18. The main mitigation measures are avoidance, during design. There remains a risk of peat landslides. An emergency response plan will be in place during construction and operation.

Potential Cumulative Impacts

16.12.19. The impacts are generally localised.

Inspector's Evaluation and Conclusions

16.12.20. The Department of Housing, Heritage and Housing is concerned that peat cutting will continue over the life of the wind farm project, which will have significant impacts and points to many policies in Mayo County Council's development plan that seek to restore peatlands to carbon sinks. I do not consider that the applicant has sufficient control over the peatlands to prevent turf cutting. Submissions from some observers indicate that they will not be relinquishing their turbary rights. There are certain sections of the peatlands which will be improved, particularly in the Biodiversity Enhancement Management Plan area. The area of the footprint of the turbines is greater than the Biodiversity Enhancement Management Plan area. However, without the wind farm, the entire area would still be subject to turf cutting. Therefore, there is a biodiversity net gain, from zero to over 10 ha. I consider that the reduction in greenhouse gases arising from both the wind farm and the hydrogen pant has to be balanced against what otherwise would be an even more rapid drainage of the cutover bog.

16.12.21. I do not consider that the difference in turbine hardstands (between 22.5 metres to 25m in diameter and 2.5 to 2.85m in depth) will have a material difference in terms

of the impacts on peat management mitigation measures. The mitigation measures once adhered to are adequate to prevent sedimentation of the watercourses in the site and vicinity of the site.

16.12.22. Observers are concerned about the storage of spoil on the wind farm site and whether this would impact on the plots where they have turbary rights. I am satisfied that the storage of spoil has been adequately considered in the Peat and Spoil Management Plan in the CEMP.

16.12.23. There are no plans to bring peat from the wind farm location to the hydrogen plant location. The removed peat from the hydrogen plant location would be replaced with either hard surface or constructed wetlands, which would have a liner. The surface drainage system will enable sediment to be captured before discharge to the Dooyeaghny Stream. Therefore, I do not consider that there will be a significant threat of increased sedimentation in that stream.

16.12.24. I am satisfied that the effects have been properly considered and responded to.

16.13. Hydrology and Hydrogeology

Issues Raised

16.13.1. Pollution risk to surface water.

16.13.2. Abstraction of groundwater will deplete wells and surface water, with consequential impacts on aquatic ecology, agriculture and domestic wells.

16.13.3. Insufficient volume of surface water to dilute the discharge from the proposed hydrogen plant, which would give rise to a threat of pollution. The data from which the capacity of the stream is not robust to be reliable.

16.13.4. The discharge from the plant may not be sufficiently diluted prior to release to the stream.

16.13.5. The need to stop ground water pumping if water levels in Spring 2 fall below a certain threshold. This requires telemetric monitoring.

16.13.6. Rainwater records were taken from Knock Airport, which experiences higher rainfall rates that are recorded at a more relevant location, at Markree Castle Weather station. This would result in greater reliance on groundwater sources than anticipated.

16.13.7. Information on groundwater levels from Niall Fox’s well cannot be relied upon.

16.13.8. Pollution risk from the potential of chemicals used in the proposed hydrogen plant arising from spills.

16.13.9. Risk of subsidence to properties due to depletion of groundwater.

16.13.10. Saline intrusion into groundwater at the coast.

Competency of the authors

16.13.11. I am satisfied with the competency of the authors.

Context

16.13.12. I note the reference in the chapter to the requirement to align with the objectives of the Water Framework Directive (2000/60/EC), for member states to achieve and or maintain at least Good status in all water bodies. It also refers to the Floods Directive (2007/60/EC) and the approach of Nature Based Solutions. Legislation and guidance that inform the chapter is listed.

Baseline

16.13.13. Surface water from the wind farm location drain to the aforementioned four rivers. The Dooyeaghny Stream by the hydrogen plant eventually drains to the River Moy. A tributary to the stream begins on the other side of the N59 from the hydrogen plant location.

16.13.14. The rivers within the wind farm location are classified as ‘good’. The Brusna to the north of T6 is classified as very good. The Dooyeaghny is also classified as good.

16.13.15. The Foxford groundwater body is classified as ‘good’. It is ‘moderately productive (Locally Important)’ with a ‘low to moderate’ vulnerability. The aquifer is 102 square kilometres. The peat soil of the wind farm has resulted in low recharge and high surface water run off rates. The surface water network is described as having a ‘rapid response to rainfall’.

16.13.16. Sampling of the water chemistry was undertaken the wind farm and at the hydrogen plant. At the wind farm locations, elevated levels of Ammoniacal Nitrogen were found in all samples, a reflection of the land use.

16.13.17. Sampling at the hydrogen plant location found elevated levels of Mercury. However, the plant will not contribute to this.

16.13.18. Groundwater under the hydrogen plant location is classified as 'Moderately Productive Bedrock (Local Importance)' and 'High Vulnerability'.

16.13.19. A *Site Investigation and Groundwater Assessment* has been carried out on the hydrogen plant location. Groundwater is at 50-80 metres below ground. Two springs discharge to the west. SP1 is located within the landholding and SP2 is on the west side of the N59, where a public pump is located. Eight boreholes were drilled and two provided a sustainable yield (Boreholes 6 and 7), which can meet the demand for water up to 232m^3 per day. It was noted that there was a marked decrease in flow after pumping in SP1 and SP2. However, the same time period was noted to be below normal or particularly low in July and August 2022, as found by the EPA in groundwater levels and spring flows monitored by the EPA.

16.13.20. The closest mapped well is stated to be 1.1.km to the north. This is a well at Corbally (1131NEW005). The report acknowledges that further study is required to identify all local wells. EPA guidelines generally require a distance of 250 metres for abstraction boreholes. During submissions, it emerged that there is a domestic well on Ms. Susan Donegan's property, some 217 metres from the site. There is also a public water main on the L6612-1.

16.13.21. In relation to the Preliminary Discharge and Assimilative Assessment for Wastewater Discharge (Appendix 9.3), the Dooyeaghny Stream was chemically sampled upstream and downstream of the hydrogen plant location in December, 2022. Site flow rates were obtained. The report notes that this is a single point in time and has a low accuracy.

16.13.22. The water quality in the Dooyeaghny Stream was found to be 'good', save for an excedence of Nitrates (c. 4.1mg/l), where the Surface Water Regulations require a reference limit of 2.6mg/l. The Electrical Conductivity was elevated (c. 596uS/cm), which indicated that is either being impacted by agricultural runoff or receiving a high volume of groundwater.

Potential Direct Impacts

16.13.23. Three water crossings are required at the wind farm location, plus the upgrading of nine culverts. There are four locations where HDD is required on the grid route (B1-B4). There is spawning grounds and nursery habitats in these areas. The grid

connection routes require 6 crossings. The interconnector route requires 4 additional crossings. The turbine delivery route from the N59 will require 4 crossings.

16.13.24. The construction phase could release suspended solids in surface water runoff, which would significantly adversely affect receiving waters and aquatic life. A worst case scenario could see a landslide that impacts on surface water. The risk of this is considered low. However, the effects of elevated suspended solids is considered adverse, large in scale and localised with a moderate to significant effect.

16.13.25. The clear felling of afforested areas could give rise to soil erosion, soil instability, changes in hydrological process, such as flow rates and patterns, increase sediment runoff and nutrient pollution. This is considered to be of moderate adverse significance, permanent but reversible, on a minor scale.

16.13.26. Spills during construction could have adverse, moderate to profound localised effect that are reversible on surface water and groundwater. Mitigation can deal with this. The same applies to the release of construction or cementitious materials.

16.13.27. The release of wastewater or chemicals associated with sanitation would potentially have a profound impact. This would affect downstream sensitive receptors, without mitigation.

16.13.28. There is potential for positive impacts on the due to the reduction in drainage of the bog water levels on the wind farm location. Groundwater here is unlikely to be impacted.

16.13.29. Flood risk assessments have been prepared for the two locations. Appendix 9.1 notes that the proposed development is located in Flood Zone C. However, it will result in a net decrease in recharge potential to groundwater, while increasing the quantity and rate of runoff to surface water. Therefore, the proposed development could increase the risk of flooding downstream. A Stage 2 Initial Flood Risk Assessment was prepared. It concluded that while here would be a net increase in surface water runoff, the impact would be adverse, but slight to moderate and amenable to a neutral impact with the use of SUDS mitigation measures, including peatland regeneration areas. Appendix 9.2 considers flood risk from the hydrogen plant. It reaches similar conclusions. In relation to mitigation, the net land sealing is circa 97%. With rainwater harvesting, several months of rainwater will be stored. The

Constructed Wetlands will hold back water for a minimum of 6 days, which will have a beneficial impact in relation to reducing downstream flood risk.

16.13.30. Process wastewater will be at its maximum during February (67.6m^3 per day). Its lowest will be in July, at 29.3m^3 per day. The report finds that to protect the quality of water to achieve Salmonid Regulation standards, a restricted discharge rate is required to ensure year round assimilative capacity. Peak flows during July needs to be reduced. Both groundwater and surface water quality and quantity will have to be continuously monitored. Wastewater storage will be required to be able to reduce discharge rates as required. The future discharge will be subject to licence from the EPA.

16.13.31. There is potential for overpumping at the hydrogen plant location, but this can be monitored and mitigated. This could impact on wells.

16.13.32. Any lowering of wells due to drawdown from the from the boreholes would be a direct, localised, significant adverse impact of the proposed development. However, this is not considered likely. It was noted that there were impacts on the two springs on site following the borehole testing.

16.13.33. Spills during operation is considered unlikely and would give rise to direct and indirect adverse, temporary effects.

16.13.34. During operation, there will be increased volumes of runoff. This in turn could exacerbate flooding events, erosion and impact on hydromorphology. There could impacts on the areas of intact peat. These would be of moderate to significant adverse effects. The net increase in surface water runoff is 124 l/sec at a 1 in 100 year scenario, which is considered a slight adverse effect. However, with mitigation, this can be significantly reduced and reduce overall surface water runoff to below greenfield runoff. This is a beneficial effect, of reducing flood events downstream.

16.13.35. At the hydrogen plant location, the increase in surface water runoff is 103.8 l/second at a 1 in 100 year scenario, which is an adverse, slight permanent effect.

16.13.36. The quantity of groundwater required for the hydrogen plant will vary, depending on the amount of rainfall harvested, which will be the primary source of water for electrolysis. The daily amount may be from 0m^3 to 178m^3 per day, or a

maximum annual demand of 65,021m^3. Rainwater harvesting is anticipated to be 52,026m^3.

16.13.37. In relation to groundwater, the boreholes are likely to have a Zone of Contribution of drawdown of circa 0.6 km at a high pumping regime.

16.13.38. Overpumping during dryer periods could deplete the aquifer in the medium to long term. If so, it would lead to significant to profound adverse impacts on a small to moderate, local scale. However, the pumping is unlikely to exceed the sustainable yield.

16.13.39. The quality of the groundwater is variable, with elevated nitrogen, phosphorous and faecal contamination found in testing. This existing contamination could overload the wastewater treatment systems on site and be transferred to surface water, a significant adverse impact. However, this is unlikely and can be avoided with mitigation.

16.13.40. Spills from chemicals stored on site would have a potentially profound adverse effect, but with proper management and mitigation measures the risk can be significantly reduced.

16.13.41. In the case of a natural disaster, it is stated that emergency response plans are in place for Mayo and Sligo County Councils (9.4.6.4.1) and that the plant will have a risk management programme, ATEX Assessment and Safety Management System. Fire water will be contained within the stormwater drainage system before being tankered off site.

16.13.42. The turbines on the wind farm will not operate if there is ice on the blades. Spoil disposition areas will store water on site.

16.13.43. The quality of the discharge from the site is likely to be of low impact or significance.

16.13.44. At decommissioning phase, the surface water system will revert to a more natural condition over time. No new impacts are anticipated to arise on the hydrological and hydrogeological environment.

Potential Indirect Impacts

16.13.45. Indirect impacts arising from the pollution of surface water.

Mitigation Measures

16.13.46. Management of excavated material will be undertaken to reduce risk of movement of sediment. Drainage works will be in place before excavation occurs. Settlement ponds, check dams, straw bales, silt fences and buffered drainage outfalls will be employed. Continuous downstream monitoring will be in place. Precast concrete will be used where possible. Shuttering will be used where concrete is poured, which will be done in dry weather conditions. Water crossings will be carried out in accordance with OPW and NRA standards.

16.13.47. Groundwater and surface water will be monitored continuously. A licence for Abstraction of Water will be obtained from the EPA and its conditions adhered to. Constructed wetlands will be lined and monitored. Rainfall harvesting will be the primary water source for the hydrogen plant. This should provide up to 80% of the water demand for the electrolysis process.

Potential Residual Impacts

16.13.48. Nature Based Solutions will be adopted to attenuate runoff, so the impacts following mitigation will be of net benefit, in terms of water quantity, quality and flood risk. There are opportunities for net biodiversity gain. The drainage regime will have a beneficial impact on blanket peat habitats.

16.13.49. Once the treatment systems are working for the discharge from the hydrogen plant, the assimilative capacity of the Dooyeaghny Stream is adequate to take the flows, save in prolonged dry weather conditions. The wastewater storage is sized at 1,500 cubic metres to be able to reduce the discharge rates to surface water or halt discharge for a minimum duration of a month.

Potential Cumulative Impacts

16.13.50. No cumulative effects are expected as there will be a neutral impact on receptors, following mitigation. In a worst case situation, any incident is likely to be minor and temporary.

Inspector's Evaluation and Conclusions

16.13.51. Observers are very concerned that the use of groundwater in the electrolysis process could lead to a severe depletion of the groundwater in the local aquifer, over time. They are concerned that this could impact on wells, ecology and European sites

and the structural integrity of the area. The recharge rate to groundwater is expected to be around 200mm/year. The Groundwater Supply Assessment provided by Minerex states that due to the rainwater harvesting, the volume of water being abstracted from groundwater is not greater than the volume of water recharging to the aquifer under the landowner's property area, if up to 80% of the water source is rainfall. I questioned Mr. Shine at the oral hearing if that calculation had allowed for the denial of recharge to groundwater, allowing for the extent of hard surface on the site. He confirmed it did.

16.13.52. The hydrogen process has a water demand of 65,021 m^3. This equates to 178m^3 per day. The thresholds for EIA for groundwater abstraction is 10 million m^3 and 2 million m^3. This equates to 27,397m^3 or 5,479m^3 per day. The EPA requires an abstraction licence is mandatory for over 2,000m^3 per day. For water abstractions between 25-1,999m^3 per day, the EPA will consider whether the application is significant or not, by way of EIA. Following the use of harvested rainfall, at conservatively 50% of water demand, the daily rate of abstraction would be 89m^3. The Zone of Contribution, as set out in Figure 4.1 while extending northwards beyond the site, shows that no wells outside of the applicant's site are affected by the proposed abstraction site. However, since the additional information was published, it has emerged that there is a private well serving Ms. Donegan's property. This information has been provided to the applicant for response. There is a public main supply in the road in front of her property.

16.13.53. The Minerex Report (Appendix 9.8) states that weather conditions when pumping was completed to be very dry (the driest August since 1995). It notes that the two springs to the west of the proposed hydrogen plant (SP1 and SP2) show evidence of a reduction in flow following the pumping test. SP2, which is where the hand pump is located showed a fall in volume from 0.65l/sec to 03.l/sec. As the flow did not return to pre-pumping levels after the test stopped, Minerex consider that the decline relates to rainfall. The IFI are concerned that a reduction in the springs would have a significant impact on the South Corbally Stream. They consider that the springs are the source of the stream. However, the EPA maps indicates that the South Corbally Stream originates upgradient of these springs. However, these springs clearly contribute to the South Corbally Stream. The IFI has requested that a mechanism to stop abstraction be put in place, should levels fall below a point in the South Corbally Stream. I am not convinced that there is a clear causative relationship, between

groundwater pumping and a decline in water levels on the South Corbally Stream, because these springs did not recover when pumping stopped. However, I consider that such a condition could be attached to any grant of permission, on a precautionary basis. This would ensure that in times of dry water flow, the steam would not fall below levels not already experienced in the watercourse.

16.13.54. One observer has asked that the findings of no effect on the well in Mr. Niall Fox's lands be discounted, as the water readings were read by an unqualified individual. I note that high resolution loggers were stated to be used by Minerex in BH6 and FW1, for the duration of pumping test and recovery period. These loggers store information, which can be downloaded to a computer. In addition, a manual water level monitoring regime was in place for all boreholes and FW1, presumably as a back-up in the event of loss of electronic data. Therefore, I am satisfied with that the data obtained manually is backed up by automatic readings and is reliable.

16.13.55. The Dooyeaghny Stream adjacent to the hydrogen plant location is shown not affected by groundwater pumping and indeed, the issue for the proposed development would be to attenuate surface water reaching the stream, to prevent flooding. The size of the groundwater body underlying the hydrogen plant is stated to be 102km^2. The aquifer is categorised as 'good' and not at risk, under the Water Framework Directive.

16.13.56. There is some uncertainty about the impact of the proposed development on SP1 and SP2, which would impact on the tributary to the west of the site. The IFI and observers are concerned that this tributary could be affected by groundwater pumping. The tributary forms part of the Newtown Catchment, which provides habitat for salmonid fish. The applicant has agreed that in the event that groundwater pumping has an impact on water flow in this tributary, groundwater pumping will cease. Given the alternatives available to groundwater supply, this can be implemented.

16.13.57. Susan Donaghy has a well which the applicant was unaware of. I note that there is an alternative public water supply in the L6612-1. Therefore, if the proposed development has an impact on this well, or other wells in the vicinity, the applicant can provide an alternative supply. This can be dealt with by way of condition.

16.13.58. Aine McCann suggests that the information in relation to the availability of rainwater to the site and the ability for groundwater to recharge, is incorrect, as it relies on information from Knock Airport, which is a distance from the site and is wetter. She

suggests that Easkey-Bunowna or Ballina are more appropriate data sources for the local area. Ms McCann may be correct in this analysis and Knock is more wet than the other two locations. However, the degree of difference between Ballina and Knock from the years 2016 to 2021 averages out at approximately 5%, from analysis of the information supplied by Ms. McCann. Therefore, I am satisfied that this difference is tolerable. The applicant has stated that they are relying on the information from Knock Airport. Knock Airport is a staffed weather observation centre, rather and an automatic weather station.

16.13.59. Due to the size of the aquifer, the preferred source of water supply being rainfall and the availability of a public mains supply and the mitigation measures which include the monitoring of water courses and the setting of trigger actions, I am satisfied that the water demand from the hydrogen plant will not result in such a depletion of groundwater so to effect local wells, the Dooyeaghny Stream, downstream European sites or cause local subsidence. This is because the volume of water required, the shape of the Zone of Contribution and the depth and stability of the bedrock between groundwater and ground levels. I do not consider that the Zone of Contribution will increase saline intrusion into the groundwater body, given it's limited extent and distance from the sea.

16.13.60. I am satisfied that, subject to condition, the quantitative abstraction constitutes a sustainable yield, will not alter the hydrological regime of either the Foxford Groundwater body, Dooyeaghny Stream, the South Corbally Stream or is like to cause a protected area to fail to achieve its conservation objectives.

16.13.61. The chemicals proposed to be used in the hydrogen plant could give risk of pollution of surface water and groundwater. However, I am satisfied that the mitigations measures, which involve physical containment as well as measure to deal with accidental/major incidents, are adequate to protect receiving waters.

16.13.62. The Dooyeaghny Stream was sampled during a time of high volumes of water, rather than in Dry Weather Flow condition, which has been criticised. However, in the event of low flows in the Dooyeaghny Stream, there is significant wastewater storage available on site, so it can be held until water levels rise. Therefore, the discharge will not give rise to a threat of pollution.

16.13.63. The abstraction will not result in the deterioration of groundwater in quantity and quality and will not lead to a significant imbalance between abstraction and recharge in the groundwater body.

16.13.64. The management of peat, sediment and surface water during construction follows methods that have been shown to be effective.

16.13.65. The chapter demonstrates that the effects of the proposed development have been considered in detail and the mitigation measures systematically worked out. The Water Framework Directive imposes a duty on the State to ensure that groundwater and surface waters, as well as inland and transitional waters) are managed in terms of quality and quantity, so that no further deterioration of ecosystems arises, that only sustainable water use is permitted, that water pollution is prevented and that the effects of floods and drought are mitigated. In relation to groundwater, a balance between abstraction and recharge must be achieved. I do not consider that the protected areas would fail to achieve their conservation objectives. I am satisfied that the proposed development complies with the Water Framework Directive.

16.14. Air Quality and Climate

Issues Raised

16.14.1. Continuation of turf cutting.

16.14.2. Dust during construction.

16.14.3. Potential for explosion.

16.14.4. Potential for hydrogen to add to greenhouse gas emissions.

16.14.5. Use of rare earth metals.

16.14.6. Human rights in relation to the mining of earth metals.

Competency of the authors

16.14.7. I am satisfied with the competency of the authors.

Air

Context

16.14.8. The chapter refers to the legislation and guidance that has informed the contents. The chapter refers to the numbers of persons who die prematurely from air

born fossil fuel pollution and notes that the shift to wind and hydrogen energies will reduce this.

Baseline

16.14.9. Castlebar is the nearest air quality monitoring site. No pollutants were found in this area that exceeded WHO guidelines. The air quality in the site is likely to be even better.

Potential Direct Impacts

16.14.10. During construction, the main effect on air quality will be dust. A number of observers have commented that dust from the drilling of the boreholes has impacted on them. Dust on vegetation can create ecological stress. Dust can leach into soil following rainfall events and can migrate to surface water.

16.14.11. Dust does not remain airborne for long and generally, deposit within 100m of the site, but can travel further if particle size is very small (from 250m to 1 km).

16.14.12. As the turbines are situated generally more than 750 metres from the site and the hydrogen plant 299m from inhabited house, this is will help mitigate effects.

16.14.13. Construction traffic and machinery will result in increased exhaust emissions over the construction period. The effects will be short-term, slight negative.

16.14.14. When operational, wind farm will generate little traffic. At the hydrogen plant, the tube trailers will operate on hydrogen and will not add to pollution. If these are not available initially, the exhaust emissions are not considered significant.

16.14.15. The hydrogen plant is expected to be able to displace circa 669 diesel vehicles per year or roughly 50,000 tonnes of CO^2 per year. Some 31,000kg of NOx and 669kg of PM would be avoided per year.

16.14.16. Oxygen will be vented from the hydrogen plant and would emit 36,375 tonnes of O^2 per year, under licence from the EPA.

16.14.17. Hydrogen fires are different from natural gas fires as the radiant heat is lower and hydrogen is buoyant. Hydrogen fires have a smaller area at risk than a comparable gas fire. Hydrogen is easier to ignite, therefore explosions are a risk. There are no toxic emissions from the flames. However, there are other chemicals in the hydrogen

plant that could be affected and produce gases that when inhaled, are injurious. These chemicals will be site in a bunded area and quantities stored will be minimal.

16.14.18. The nearest dwelling not associated with the development is 299 metres from the site boundary. Due to these distances, fire safety mechanisms and the dilution effect on air pollution, the effects are considered small and adverse, in the event of an explosion.

Potential Indirect Impacts

16.14.19. Indirect positive impacts from the phasing out of fossil fuel and reduction of greenhouse gases. This will be long term and moderate positive on climate.

Mitigation Measures

16.14.20. Dust emissions will be minimised, public roads cleaned and a complaints procedure put in place.

Potential Residual Impacts

16.14.21. During construction, following mitigation, impacts will be limited and imperceptible during operation.

Potential Cumulative Impacts

16.14.22. No significant cumulative impacts anticipated.

16.14.23. The main concern of Observers is the risk of explosion. The chapter deals with this issue and I accept the finding, as confirmed by the HSA, that the risk of explosion is very limited.

16.14.24. The proposed development will give rise to dust during construction, which Observers have experienced already. However, I am satisfied that measures can be put in place to minimise fugitive dust.

Climate Change

Context

16.14.25. The chapter refers to policy, set out above in other sections, on the need to reduce greenhouse gases by 2030 and reach net zero by 2050.

Potential Direct Impacts

16.14.26. It states that the impacts of the wind farm will be considered separately from the hydrogen plant to avoid double counting. The carbon calculator used is the one produced by the Scottish Government. It includes, *inter alia*, the effects of drainage works, forestry felling, peat disturbance and the manufacture of wind turbines. The recycling or reuse of turbine blades is not considered. The assumptions are set out in Appendix 10.1. Observers have pointed out that detailed examination of the manufacture and use of gases within the turbines and other rare earth metals have not been included in this calculation. I have no evidence whether these issues have been accounted for by the Scottish Government when producing this calculator, but the technical guidance supporting the tool states that a full life cycle analysis on an individual basis is prohibitively expensive on a site by site basis, so generic data is provided as alternative. The human rights of persons mining raw materials is outside the scope of the assessment of this application.

16.14.27. Two sets of calculations have been prepared, on the basis of a 5MW turbine and a 6MW one. The calculations include for carbon losses due to back up, which includes 'spinning reserve' and 'standing reserve', another issue of concern to observers.

16.14.28. The carbon losses are stated to be 139,107tonnes and 161,083tonnes, respectively, over the 40 year life. The turbine manufacture accounts for between 42-44% and the backup power losses 35-36%. The felling of forestry account for between 20% to 17%.

16.14.29. The carbon savings take account of the variability of wind. It finds that there would be a displacement of 2,056.672 and 2,468,007tonnes of CO^2.

16.14.30. The hydrogen plant is anticipated to displace between 40,529 and 49,883 tonnes of CO^2 annually, based on the haulage industry. There will be also improvements in air quality as sulphur Oxides and Nitrogen Oxides are reduced.

16.14.31. The carbon losses from manufacture of the plant and loss the peat surface is calculated as being between 139,496 and 161,482 tonnes of CO^2. This will take between 2 years and 4 years to offset.

Inspector's Evaluation and Conclusion

16.14.32. Observers have questioned the methodology and the accuracy of the carbon loss figures. I am satisfied that the use of the Scottish Government's carbon calculator, while it may not account for all variables, provide a methodology that has been tested and can be replicated. The carbon displacement far exceeds the carbon losses and I am satisfied in this regard.

16.14.33. The DAU are concerned that turf cutting will continue on the wind farm site and the proposed development offers on opportunity to cease this use on the site. Otherwise, the wind farm will continue to emit carbon. I agree that the proposed development would be enhanced if the wind farm was rewetted. However, this is not before the Board and on balance, it is considered that the use of the site as a wind farm with turf cutting is preferable for the site than the 'Do-Nothing' alternative. I note that Observers have referred to continuing to avail of their turbary rights.

16.14.34. The overall reduction is CO^2 by displacement with green hydrogen is very positive. Therefore, while there may be some leakage of hydrogen to the atmosphere, I consider that the extent of removal of CO^2 is significantly more beneficial.

16.14.35. I consider that the chapter has adequately dealt with matters.

16.15. **Noise and Vibration**

Issues Raised

16.15.1. Noise during construction, both from works and traffic.

16.15.2. Potential for subsidence of properties from vibration during construction.

16.15.3. The equipment models in the hydrogen plant are not specified.

Competency of the authors

16.15.4. Following assessment of the Noise and Vibration Chapter, I had concerns over some of the information provided in relation to noise from the wind turbines, which capped noise analysis at a wind speed of 5 metres per second. Prior to the oral hearing, I requested that the relevant sections of the chapter be reviewed and that the baseline in regard to the existing wind farm be clarified. At the oral hearing, a revised noise chapter was submitted. It is this revised noise chapter that forms the basis of the

analysis below. The changes made to the submitted chapter are highlighted in yellow. The documents from the Oral Hearing have been readvertised.

Context

16.15.5. The chapter sets out the legislation and guidance, including draft, that informs the contents. It also refers to the noise condition on the grant of permission on the wind farm location and that recent decisions from the board have included an additional limit of 40dB(A) $L_{90\ 10\ min}$ below wind speeds of 5m/s.

16.15.6. It states that during procurement of the turbine to be used, there should be no clear tonal or impulsive element audible at any noise sensitive receptor.

16.15.7. Other Amplitude Modulation (OAM) is amplitude modulation other than the normal 'swish' of the blades. A study in 2007 of 133 operational wind farms found that 27 wind farms had noise complaints and OAM was a factor in between 4 and 12 of these. It is not feasible to reliably predict if OAM will arise or not, but it can be dealt with.

16.15.8. Infrasound and low frequency sound is referenced. Infrasound is present in the natural world. There are many sources of low frequency sound in homes, including water supply and kinetic movement. Low frequency is the range between 2 to 200Hz and infrasound below 20Hz. Wind in the natural environment generates low frequency and infrasound. The level of vibration for a wind turbine is 0.2mm/s at the base of a turbine and is below the human threshold of perception.

16.15.9. The South Australian EPA (2013) found that when investigating infrasound, found air conditioners, traffic and noise from people were the worst contributors to infrasound and that turbine generated infrasound is insignificant in comparison to background infrasound in the environment. Other international studies have found no link between wind turbines and human health. The Finnish Government in 2020 undertook a study where participants consisted of those suffering from symptoms from wind farm infrasound and those who did not. Neither group were able to make out infrasound frequencies when tested.

16.15.10. The Nordex N149 was selected for assessment as it generates the highest sound power of the turbines being considered for the site. The maximum sound power is stated to be 105.6dBa, which is the same for the two potential hub heights.

Baseline

16.15.11. The cumulative effect of existing wind farms within 5km were also included (a variety of Enercon turbines). These have a maximum sound power of 104.4 dBA at On the dates of site visits, these were stated to be inaudible.

16.15.12. At Table 11.11 the prevailing background noise is given. However, the background noise is stated to be filtered for wind farm effects. I requested that the existing wind farm noise contour map be provided so as the current baseline could be assessed and this was provided at the oral hearing (Existing Wind Farm Noise Contour Map of Cumulative effects). This drawing demonstrates that the houses closest to the Carrowleagh wind farm are currently experiencing a noise environment of between 35 to 40 dB.

16.15.13. In Table 11.11 the baseline, 5dB has been added, which is consistent with the noise condition on the wind farm previously permitted on site. A methodology is referred to in Section 11.2.3.1, but this paragraph is not in the EIAR.

16.15.14. Baseline noise monitoring was carried out in four locations (H3, H5, H7 and H28).

16.15.15. Baseline noise monitoring for the hydrogen plant was carried out at four locations, in August 2022. Noise levels were generally less than 46 dBA L_{eq} during the daytime and 36 dBA L_{eq} at night. The area can be considered a quiet area, notwithstanding the proximity to the N59.

Potential Direct Impacts

16.15.16. Noise will arise during the construction of the wind farm. This is not considered to generate intensive noise, with the highest noise level likely to be experienced from a noise sensitive location being of the order of L_{Aeq} 1 hr Range being 48 db. Felling of trees will be experienced at under 30 dB. Maximum road traffic noise levels will be generated by the delivery of concrete for the foundations. These are estimated to be 55.8 LAeq 1hr, at 10 metres from the roadside. However, only 13 days are required for these pours. There will be a significant increase in the traffic noise from construction trucks carrying fill material. Works to the public road will involve the breaking open of the public road will generate noise of 67-70 dB at a distance of 15 metres. Road

widening will be of short duration with low level noise emissions. Ground vibration is not considered likely.

16.15.17. In operation, the predicted noise levels at L90 at varying wind speeds show a maximum noise at there is no occupied house that comes within the noise contour of 45 dB. of the wind farm. The houses on the road nearest the site sit within the 40 to 45 dB contour line.

16.15.18. The prevailing background noise for the four dwellings where noise monitoring was carried out is set out below, for a wind speed of 7 m/s. I have provided for the proposed operational noise levels, as set out in Table 11.14 at LA90 of the EIAR. The proposed dBA is less than 43dBA for all noise sensitive receptors.

Table 2: Comparison between baseline and proposed at 7 metres per second

House No.	**Time**	**Existing dBA**	**Existing =+5dB**	**Proposed dBA**	**Difference between +5dB and Proposed**
H3	Day	33.3	38.3	41.6	3.4
	Night	29.6	34.6		
H5	Day	31.2	36.2	38.3	2.1
	Night	29.6	34.2		
H7	Day	33.9	38.9	38.4	-0.5
	Night	31.2	36.2		
H28	Day	35.2	40.2	34.3	-5.9
	Night	36.7	41.7		

16.15.19. The main noise associated with the construction of the hydrogen plant would arise during the levelling of the site. Predicted noise levels are loudest HH1, some 294m to the northeast of the site, at between 39-58 LAeq dB 1 hr Range, but this is not occupied. HH6, some 458 metres from the site, would experience between 35-54 LAeq dB 1 hr Range. Construction traffic, which is estimated to take 21 months, would

effect HH6 as well as other houses on the L6612, are estimate to be in the 35-54 LAeq dB 1 hr Range. There will be increased noise at the access to the hydrogen plant.

16.15.20. The operational noise of the hydrogen plant includes equipment that generate high levels of noise. However, the noise sensitive receptors near the plant are relatively distant from the plant, with the nearest 12 dwellings between 294 and 640 metres. Noise from the plant at the nearest dwelling (HH1) is 31 dBA L_{Aeq} 1 hr dB, which is below ambient noise levels. Operational trucks are expected to generate noise levels 50 dB Laeq 1 hr. HH6 is the nearest dwelling to the access road.

16.15.21. Ground vibration from the operation of the hydrogen plant is stated to be below human threshold of 0.2mm/s, including HGVs.

Potential Indirect Impacts

16.15.22. None stated.

Mitigation Measures

16.15.23. General good practice will be implemented during construction, in keeping with BS 5228. During operation, some turbines will operate at a reduced rate to minimise impacts on residential amenities. A Serrated Trailing Edge will be used to reduce noise from the blades.

Potential Residual Impacts

16.15.24. As per the operational effects.

Potential Cumulative Impacts

16.15.25. The overall cumulative effects with the existing wind turbines and proposed wind turbines are acceptable, as they are less than 43dBA.

Inspector's Evaluation and Conclusions

16.15.26. In relation to construction noise, most concern expressed was related to construction traffic for the wind farm, which will significantly increase traffic noise on the local road network. Having regard to that, I have recommended that in the event of a grant of permission, that construction activities begin at 08:00, rather than the 07:00 start time requested. If concrete pours are required, which entail longer working days, I am satisfied that a deviation in times can be agreed with the planning authority, as this entails only 13 days.

16.15.27. The related issue of concern for observers is the impact of ground vibration from construction traffic. I would concur with the applicant that I do not consider that ground vibration is likely to impact on property. However, in the event of a grant of permission, I am recommending a condition that the applicant conduct a visual condition survey of properties along the construction route in the local area around the wind farm and hydrogen plant, prior to commencement of works. This will provide reliable evidence to those concerned about the visual condition of their properties, before and after construction.

16.15.28. I have examined the baseline noise contours as set out in the existing wind farm noise contour maps and the nearest dwellings are located between the noise contour lines of 35dB to 40dB. The predicted Wind Farm noise contour map cumulative effects, shows that the nearest houses still within this noise contour. There is a difference between Table 2 set out above, which finds H3 as experiencing 41.6dBA at a wind speed of 7m/s. Therefore, while there will be an increase in noise for some, that increase remains within acceptable limits.

16.15.29. Noise from operation of the hydrogen plant was debated at the oral hearing. The lack of specificity of the equipment being used was a matter of concern. Each different brand of equipment has their individual noise identity and the absence of specificity, the observers contend, means that the predictive noise is not likely to be very accurate. While I would concur that individual models have their individual sounds, that does not prevent operation noise emission levels being specified in a licence. The noise levels indicated come well within the scope of acceptable noise for industrial plant and are below ambient noise levels. The noise from HGVs are also below 55dBA. I therefore do not consider that noise is a reason to refuse permission. I recommend to the Board not to attach a noise condition for the operation of the hydrogen plant, as this would be subject to an IED licence.

16.16. Landscape and Visual Amenity

Issues Raised

16.16.1. Capacity of the landscape to absorb additional, higher turbines.

16.16.2. Visual impact on the setting of archaeological monuments and sites.

16.16.3. Height of the turbines in the landscape.

16.16.4. Jarring effect against lower turbines.

16.16.5. Scale of the hydrogen plant.

Competency of the authors

16.16.6. I am satisfied with the competency of the authors.

Context

16.16.7. The legislation and guidance that informs the chapter is set out.

Baseline

16.16.8. The location of the wind farm is in the transition area between the upland Ox Mountains, which is peatland and forestry dominated and the rolling farming landscape, where the hydrogen plant is to be located. West of the N59 is the coastal landscape. There are a number of wind farms in the area, including the adjoining Carrowleagh.

16.16.9. The wind farm location can be described as a Flat Peatland Landscape, as set out in the *Wind Energy Development Guidelines* 2006. This type of landscape is considered particularly accommodating to this form of development, which are considered to correspond in terms of scale.

16.16.10. The hydrogen plant location is set back from the N59.

Potential Direct Impacts

16.16.11. The Zone of Theoretical Visibility identifies that where the wind farm can be seen, it will generally be visible in its entirety. In contrast, the hydrogen plant is more sporadic and intermittent.

16.16.12. The wind farm would be visible in a number of scenic routes in Sligo and this can be seen in VRP 1,2,3,8,10 and 15. The wind farm will be visible from the R294 at Bunnyconnellan, which can be seen in VRP 19 and 20. There are a number of walking routes around the Ox Mountains and the Eurovelo route for cyclists and the wind farm will be visible in views, which is currently the case for the other wind farms in the area.

16.16.13. The area within 5km of the proposed wind farm is considered to have a medium-low degree of landscape sensitivity. At 15-20km, the landscape sensitivity is considered medium. The area within 2km of the proposed hydrogen plant is considered medium-low. Construction impacts are considered minor.

16.16.14. The tie-in to the 110kV line is considered to add to scale and intensity of the electrical transmission infrastructure.

16.16.15. The wind farm substation will only be prominent in close proximity.

16.16.16. During operation of the wind farm, the turbines will be assimilated into the landscape, within the context of existing turbines. While there is an increased in scale and intensity, the chapter considers that this will not detract from the character of the landscape. The impact will be of long duration, but is reversible. Beyond 5km, the impacts are considered low to negligible.

16.16.17. At the proposed hydrogen plant, there will be some loss of trees and the proposed roundabout will be visible. The roundabout will be conspicuous and the impact is considered medium. The building will resemble a very large, agricultural shed. Its impact is considered medium-low.

16.16.18. The visual impact significance of the 26 viewpoints is considered limited, ranging from imperceptible to slight to moderate negative.

16.16.19. The design envelope between 177m and 185m tip height is considered and a number of viewpoints are selected for comparison (VP 10, 19 and 20). These are short to mid-distance as in excess of 10 km, the difference will not be legible. Even with the three viewpoints chosen there is little discernible difference.

Potential Indirect Impacts

16.16.20. None stated.

Mitigation Measures

16.16.21. Thes have been implemented by way of design, with landscaping provided for the proposed hydrogen plant.

Potential Residual Impacts

16.16.22. None stated.

Potential Cumulative Impacts

16.16.23. Due to the presence of wind farms in the general area, the cumulative impacts read as a legible pattern. There are 58 turbines, which would increase to 71. However, the concentration is not so great as to represent a tipping point where the landscape becomes dominated by turbines. It is considered that there will be some visual clutter.

The increased height of the proposed turbines above the existing turbines is considered to fit with perspective – that the smaller turbines are further away (VP3 and VP10). The impact is considered medium.

Inspector's Evaluation and Conclusions

16.16.24. Mayo County Council is concerned that the landscape cannot absorb the additional height of the turbines over those existing and previously permitted. I am of the opinion that fewer but taller turbines have less of an impact. I consider that the landscape is sufficiently robust to accommodate the additional turbines. The increased height over the existing turbines does not appear jarring. The difference in tip height, be it to 177m or 185m, is not discernible from a distance. Even at close range, I do not consider that the difference will be appreciated, given the overall heights of the turbines.

16.16.25. The visual impact of the hydrogen plant was questioned by Sligo County Council. While a large building, I consider that its visual impact will not be excessive due to limited views of the building from the N59.

16.16.26. I am satisfied that the chapter has sufficiently addressed the impact of the proposed development on the landscape and it's visual impact.

16.17. **Material Assets and Other Issues**

Issues Raised

16.17.1. Interference with turbary rights.

16.17.2. Forestry grants.

16.17.3. New cables will interfere with existing services.

Competency of the authors

16.17.4. I am satisfied with the competency of the authors.

Context

16.17.5. The legislation and guidance documents that informs the chapter is set out.

Baseline

16.17.6. The wind farm location was opened up to turf cutting in the 1930's. There are approximately 650 plots, 50m x 180m in area. They are single plots for residential individual use rather than commercial in scale.

16.17.7. A wind farm has been permitted on the site and at time of application, had an extant permission. The 21 no. turbines permitted had a power capacity of 48.3 MW.

16.17.8. There is an area of mature forestry on site, of 5.83ha which is to be felled. The forestry was planted in 1998 and due to be felled in 2040. The forestry is stated to be of very poor quality, with a low yield class productivity and will produce a mostly low-quality timber product at the end of the rotation.

16.17.9. The areas of the wind farm location that will be used by the wind turbines will change use from turbary to renewable energy use (circa 27.55 ha). The remainder will continue to be used for turf cutting.

16.17.10. The hydrogen plant location is currently in use for horse grazing.

16.17.11. The ESB has a UHF Point-to-Point telemetry radio link that passes through the wind farm site.

16.17.12. There is a grid connection agreement in place with EirGrid, associated with the previous permission.

16.17.13. Air navigation may be effected by wind farms, including radar. Turbines can obstruct aviation. All structures over 150 m in height are required to have lighting to warn aviation traffic. This will apply to this proposed development. Ireland West Knock Airport is 27.3 km to the south-east and Sligo Airport, which is the helicopter search and rescue base is 28.7 km to the north-east.

16.17.14. In terms of existing services in the roads, these will be surveyed to enable safe installation, to avoid any interruption in service.

Potential Direct Impacts

16.17.15. There will be the loss of the dwelling unit on the site, but it will be replaced.

16.17.16. A forestry licence is required for felling and an equivalent area is required to be afforested. This will be carried out in an area that is not hydrologically connected with the catchment of the project. The developer will not carry out the felling of trees without

the relevant afforestation licence being in place. There is significant forestry within 1km of the site (135ha), so the loss of this area of forestry is not significant.

16.17.17. The road network where the grid connection and interconnector will run under, will be improved in a number of locations, due to localised widening, following disruption during construction.

16.17.18. There will be abstraction of groundwater but this can be achieved without depletion and contingency plans are in place, if monitoring wells identify that groundwater levels are low.

16.17.19. Telecommunications may be interfered with. T2 will interfere with the UHF telemetry radio link. This will require mitigation.

16.17.20. Television in Ireland is now digital, there is less impact on signal. Combined with the distance to the nearest dwelling, no significant impacts are expected.

16.17.21. The grid connection will require tie in with the existing Glenree-Moy 100 kV OHL, by way of towers. This will require the OHL to be de-energised by ESB. However, this will not interfere with energy supply as the network will be configured to avoid this section.

16.17.22. The proposed development will contribute to the electricity network. Wind energy needs to be curtailed or dispatched down (as referred to by the observers) when constraints arise. In 2021, 7.3% of wind energy could not be used. The dispatch-down will be addressed by providing energy to the hydrogen plant via the interconnector. This will allow excess energy to be stored.

16.17.23. ASAP SRO prepared a report on aviation risks for Sligo Airport and found that no risk arose (Appendix 13.3).

16.17.24. The use of crushed stone and concrete from the four identified quarries are considered. Some 50,277 cubic metres of materials is required.

16.17.25. Waste will be generated during construction and operation. This will be stored and removed from site. At operation stage, wastewater will tankered off the wind farm to Ballina wastewater treatment plant.

16.17.26. Wastewater, chemical or hydrocarbon spills, groundwater etc. have been discussed above.

Potential Indirect Impacts

16.17.27. None stated.

Mitigation Measures

16.17.28. A relay mast will be constructed for interference with an ESB radio link.

16.17.29. During construction, the IAA will be advised of crane operations, in advance of their erection. Warning lights will be installed on the turbines.

16.17.30. Site services (electricity and water) will be identified through mapping and scanning. The public will be provided with updates on construction activities, which might affect access to lands. The trench will be approximately 0.6m wide by 1.315 in depth and take 12 months to install. The cables in public roads will be left there permanently and become the property of ESB.

16.17.31. Construction waste, refuelling, packing, metals etc. will be dealt with appropriately and reused or recycled where possible.

Potential Residual Impacts

16.17.32. Road closures and diversions will still cause delays to road users during construction.

16.17.33. The character of the area will be slightly negatively effected by the loss of forestry, but it is in keeping with the emerging pattern of development in the area.

16.17.34. Turbary will continue over most of the site.

Potential Cumulative Impacts

16.17.35. Two single turbines permissions have been granted in proximity of the site. Two licences for thinning of forestry on circa 29 ha of land have been approved.

16.17.36. It is noted that there will be cumulative effects with other projects as they are the source of crushed stone for all developments.

Inspector's Evaluation and Conclusions

16.17.37. One observer was concerned about grants received for the forestry plantation. This is not a planning issue, but I note that Appendix 13.1 Forestry Report prepared by Veon Ltd. States that any grants associated with the forestry can be applied across to the new afforested area. Observers are concerned that the underground cables will

interfere with existing underground services. I consider that the laying of cables can be carried out with sufficient care that this problem will not arise. I note that the CEMP identifies that these works will take a 12 month period for the cables to be installed. Observers are concerned about interference with turbary rights. The applicant has stated that turf cutting will continue on site. I consider that the chapter has addressed the issue of material assets satisfactorily.

16.18. **Cultural Heritage**

Issues Raised

16.18.1. Impact on the setting of recorded monuments.

16.18.2. Interference with a potential winter / summer solstice relationship.

16.18.3. Interference with monuments close to public roads during works.

Competency of the authors

16.18.4. I am satisfied with the competency of the authors.

Context

16.18.5. The relevant legislation and guidance is set out.

Baseline

16.18.6. The court tomb at Carrowleagh (MA031-034) dates from the Neolithic period (4000-2400 BC). It is described as being very well preserved, with an east-west orientation. It is a circular mound, circa 25 m in diameter, with a forecourt area leading to a series of small chambers. There may have been a ritual alignment with the wider landscape. There are a number of these court tombs up to 7 km from the site.

16.18.7. There is a barrow site SL022-026 adjacent to the hydrogen plant location (also a burial site), 13 m in diameter. There is a wedge tomb (MA04-094) 240m north of the wind farm location. A bronze spearhead was found in the bog in Carrowleagh. There are 14 no. recorded archaeological monuments within 1 km of the site.

16.18.8. Archaeological testing was undertaken for the wind farm location under the previous planning permission. Twenty-one trenches were excavated and no archaeological deposits were found, other than a burnt spread.

16.18.9. There are no designated cultural heritage constraints on the interconnector and grid routes, but there are eight recorded monuments within 100 metres. In particular, there is a ringfort (MA031-047) and a ring fort (MA031-023) with children's burial ground (MA0231—023001) adjacent to the grid connection route.

16.18.10. No impacts are expected on the turbine delivery routes. There is a protected structure, a bridge RPS Ref 428 on the construction haul route.

Potential Direct Impacts

16.18.11. No direct impacts on the designated archaeological monuments or the discovered burnt spread are expected at the wind farm location or the hydrogen plant location. There is potential for subsurface features or items to be discovered during construction.

16.18.12. At the hydrogen plant location, there were two former lime kilns that are shown on the 1st edition of the 1837 OS map. The sheds to be demolished would be a direct negative impact.

16.18.13. For the grid connection and interconnector routes, where these are located on the existing road infrastructure, there is unlikely to be direct impacts. The area proximate to the ringfort MA031-023 and children's burial ground MA031-023001 may have some potential. There may be subsurface features in the green field sections.

16.18.14. On the turbine delivery route, of the two locations where work is required, there are no heritage constraints. On the construction haul route, there is a protected bridge (ref. 428) at Emlymoran in Sligo and care will be taken to ensure that no inadvertent damage arises.

Potential Indirect Impacts

16.18.15. There will be temporary short term impacts on the court tomb MA031-034 in the wind farm site, to the setting, due to construction works. There will be a long term impact on the setting of this monument. The wedge tomb MA031-005, outside the site, is not currently visible because of forestry. Therefore, there will be no negative impacts from the construction works.

16.18.16. The rebuilding of a new dwelling would have a direct negative impact on the setting on the barrow site, SL022-026, of medium impact.

16.18.17. Two undesignated cultural heritage receptors outside the hydrogen plant location are a possible turf stand and a rock outcrop with folkloric associations. Exclusion zones will be put in place.

16.18.18. At operation stage, there will be an indirect effect on the setting of the court tomb MA031-034. The court tomb has an E-W axis orientation and an open gallery to the east. The impact of the wind farm on the setting is described as long term but reversible, negative impact of a high magnitude on a medium value receptor, with a significant or very significant effect.

16.18.19. The EIAR states that is cannot be ascertained if specific archaeol-astronomical alignment features were an integral function of the monument (14.5.5). Four other such tombs were studied in the area. The orientation is common in these tombs. Observers are concerned that there is potential for shadowing from the turbines to restrict sunlight from reaching the tomb during the spring or summer solstice.

16.18.20. This issue was responded to by the applicant's agent, that states that it cannot be ascertained that simply as the tombs face east, there is a deliberate alignment with the rising sun at the spring equinox. There is no published academic research to support this for court tombs in Ireland. The wedge tombs have been investigated for this and this has not been supported.

16.18.21. The other archaeological monuments in the area will not be effected in relation to setting, due to distance and limited or glimpsed views. This includes Rosserk Abbey MA022-082001, where there are no predicted impacts.

Mitigation Measures

16.18.22. Archaeological monitoring will be carried out of ground works for the wind farm and testing for the hydrogen plant. Works exclusion zones will be put in place. A full written and photographic record will be undertaken of the court tomb, MA031-034. Archaeological monitoring works will also be undertaken at the ringfort MA031-047 and children's burial ground MA031-023 and MA031-023-001.

Potential Residual Impacts

16.18.23. There will be a residual effect where the vernacular sheds are lost and near the ringfort MA031-47 on the grid connection route, during construction. The indirect impacts on setting of construction works will have some impact. The court tomb

MA031-034 and wedge tombs will still experience indirect impacts on setting during operation.

Potential Cumulative Impacts

16.18.24. There is already an impact on the setting of the court tomb MA31-034 from the existing wind farm east of the site. The cumulative impact is considered of medium magnitude.

16.18.25. At decommissioning, the impacts are removed, but exclusion zones will be required.

Inspector's Evaluation and Conclusions

16.18.26. The proposed development will have an impact on the heritage features in the landscape. I would accept that the impact is indirect and will remain in place for a long period of time. However, I do not consider that the visual impact is so significant to warrant refusal of permission.

16.18.27. The concern of observers is whether T11, which is east of the court tomb MA031-034, would interfere with the sunrise entering the tomb at the Spring Solstice or if there would be similar interference at the Summer Solstice for the wedge tomb from T6. I note that T11 is actually further south than the court tomb and circa 300m distant. The turbine cannot physically obstruct the first light of the sun due east of the court tomb. Any interference that might occur arising from shadow from the turbine would happen later in the morning and therefore not interrupt this relationship, should it exist, in my opinion. T6 is similarly further south and while closer to MA031-005, cannot physically obstruct the first light of the rising sun. Given its location distance from the internal tracks within the wind farm location, it is unlikely to be affected by these.

16.18.28. At the oral hearing, the applicant offered to create a walkway to the court tomb, which would be universally accessible. This was accepted by the observers. However, I consider any such walkway should be developed separately, so the archaeological conservation implications of the walkway can be properly considered by the appropriate authorities. In the event of a grant of planning permission from the Board, I have not conditioned this walkway, for this reason.

16.18.29. The wedge tomb, MA031-005, is surrounded by forestry. There is no impact on the tomb from the turbines in its current condition. Given MA031-005's distance from the public road, I do not consider that it will be affected by road widening.

16.18.30. I note the presence of a well circa 90 metres southwest from the proposed upgraded junction, at the junction of the N59 and L6611, which observers have referred to. It is not mentioned in the EIAR and so may has no cultural value. I am satisfied that the changes in the road network at the hydrogen plant location will not impact on the setting of the well. The chapter is considered satisfactory.

16.19. Traffic and Transport

Issues raised

16.19.1. High vehicular accident rate that is not recorded.

16.19.2. Construction traffic leading to delays and traffic being forced onto less suitable roads.

16.19.3. Traffic safety during construction.

16.19.4. Traffic safety during operation.

16.19.5. Impact on the Eurovelo route and cycling.

16.19.6. The applicability of the Road Safey Audit.

Competency of the authors

16.19.7. I am satisfied with the competency of the authors.

Context

16.19.8. The chapter refers to the legislation and guidance that informs it.

16.19.9. There are various elements of the project which are traffic related. Construction works, which includes for the delivery of turbine components, building materials including crushed stone and concrete, a separate route for leaving the wind farm location and two haul routes for construction of the grid connection and interconnector. The alteration of the existing access from the L-66121-1 to the N59 and provision of a roundabout.

16.19.10. The wind turbines are abnormal loads, which may oversail third party properties or may need road widening or removal of street furniture and signs. A Swept Path

Analysis has been carried out for both potential routes from Killybegs Harbour or Galway Port. The Swept Path Analysis has been carried out by Collett Consulting, which would deliver the turbines. It is noted that the length of the blade tested is the longest under consideration (76.58 m). The Killybegs route has already been utilised for other wind farms in the area.

16.19.11. In the scoping process, TII were concerned with the impacts that the proposed development would have on the national road network, among other issues. Mayo County Council requested a structural survey of the road network for construction traffic.

16.19.12. The quarries (seven in number) from which the crushed stone and cement will taken from are identified and the routes that the HGV's will take are specified. The wind farm traffic will turn from the N59 onto the L-6612 and on to the wind farm location. The hydrogen plant traffic will turn from the N-59 to the L-6612-1.

16.19.13. Trees felled from the site will be transported to West Timber off the N59 in Ballina. While peat will be stored on site, general soil waste will be sent to a licenced site (four are identified).

16.19.14. There are already passing bays on some of the local roads.

Baseline

16.19.15. Traffic counts were carried out on Tuesday, 14th December, 2021. However, these figures for the N59 were calibrated from 2019 were used as these were considered more representative of traffic outside of Covid restrictions, which was slightly higher. The TII traffic counter on the N59 is located in Corbally. The AADT was 4,042, of which HGVs accounted for 4.85%.

16.19.16. Traffic counts are estimated to have a AADT of 5,859 for the N59 and the L-2604, the road to Stokane which the turbines will use is estimated to be 842. The local roads are very lightly trafficked, with very few vehicles using the L-6612-1 junction with the N59. Future traffic growth by 2026, traffic on the N59 is expected to be 6,100 AADT, which is approximately 52.5% of capacity (11,600 AADT). The local roads have a guidance capacity of 5,500 AADT. The construction and operation of the proposed development can be accommodated.

16.19.17. The traffic accidents recorded on the N59, which is a significant concern for observers, which occurred outside of the built up area, were 28 in 2016 and 2014 and 33 in 2015. Between 2013 and 2016, there were 3 fatalities (later figures are not available on the Road Safety Authority website). The observers had been personally involved with a number of accidents.

16.19.18. The local roads which the grid connection and interconnector is to use will require works to enable the trenches to be excavated. This will involve river crossings, using HDD.

16.19.19. The internal access roads in the wind farm location will require upgrading and a new internal access road created.

Potential Direct Impacts

16.19.20. A number of physical road works will be required for the delivery of the turbines, depending on the route used. These road works include road widening, removal of street furniture and signs and pruning.

16.19.21. During construction, there will be traffic restrictions in the local area, which will necessitate road diversions. This is of concern to observers, both in terms of ordinary life and the potential delay to emergency vehicles in the event that they are required.

16.19.22. The roads have the capacity to accommodate the proposed development (the N59 AADT would rise to circa 70%), but there will be inconvenience to local road users. The timescale is stated to be 21 months. The estimated number of deliveries is described in Table 15.21, which provides quantities of materials to be imported. Some 7,058 deliveries are expected associated with the civil/electrical construction works. The number of deliveries associated with the turbines is 880. The grid and interconnector deliveries are 3,801. The total is estimated to be 11,739 deliveries. The bulk of these occur within the first 10 months of the construction period. An average 42 HGV trips per day is expected. In addition, staff trips of 125 trips per day is expected. A peak of 390 movements per day is expected. The impacts on the local road network will be negative, high and short in duration.

16.19.23. The impact on pedestrians and vulnerable road users is considered a negative impact in terms of amenity and intimidation. Observers have pointed to the wind farm access being on the Eurovelo and that no mention is made of cyclists specifically in

the chapter. I note that there are a number of cycle loop routes around Bonnicolan. There is no doubt that there would be an adverse impact in the short term for these road users.

16.19.24. There would be mud and debris on the road, but this is of minor impact of short duration and can be mitigated against.

16.19.25. Impacts in terms of noise and emissions are described in the other relevant chapters.

16.19.26. There is a much reduced impact during decommissioning.

16.19.27. During operation, there is little impact from the wind farm. The hydrogen plant will generate some 618 AADT, or 5.3% of capacity. The increase is considered imperceptible.

16.19.28. A Road Safety Audit has been carried out for the revised junction of the N59 and L-6612-1 (I note that the cover page incorrectly identifies the location, but the audit, drawings etc. show the correct location). A number of recommendations were made to improve the safety of the proposed scheme, which have been incorporated into the proposed junction.

Potential Indirect Impacts

16.19.29. No indirect impacts are listed.

Mitigation Measures

16.19.30. A Traffic Management Plan will be submitted. HGV trips will avoid opening and closing times of schools. Abnormal loads will travel at night. Repair works will be undertaken if necessary. Diversion routes will be in place for road closures. The L-1101 and L-6612-1 will not be closed at the same time.

Potential Residual Impacts

16.19.31. During construction, there will remain a high, negative impact after mitigation. However, in the longer term, physical improvements to the road network would be positive.

Potential Cumulative Impacts

16.19.32. If cumulative impacts arise with other wind farm developments, deliveries can be co-ordinated.

Inspector's Evaluation and Conclusions

16.19.33. The RSA submitted with the application identified that left turning HGVs leaving the site are required to cross the N59 centre line and recommended that the junction be redesigned to prevent this. This has been carried out prior to submission of the application, as stated in the second response to submissions by the applicant's design team.

16.19.34. In the second response to submissions, the applicant submitted a Priority Junction Design Report. This refers to the vertical alignment of the N59. The west bound approach (Sligo to Ballina) has a downhill gradient of 2% and uphill gradient of 3.5%. The current access has a crossfall of 1% and the realigned L6612 –1 will have a balanced crossfall of 2.5% at the dwell area. Visibility spaces of 215m in both directions will be available.

16.19.35. While the observers are particularly concerned with construction traffic and the suitability of local road for traffic diversions, the local road network has been utilised for wind farm construction in the past. I note that the Swept Path Analysis of the haul routes shows where additional works are required, but these works are relatively limited in extent. The location of passing bays and whether there is consent to undertake these works, has been questioned by Observers. The applicant has stated that all necessary consents are in place, I am satisfied that the drawings show the passing bays. In relation to consent, Section 34 (13) of the Planning and Development Act applies. Noting that, I am satisfied that the road network can accommodate the construction traffic for the wind farm and the hydrogen plant. I note that the difference in the size of turbine hardstands would result in slightly less traffic for the 22.5m diameter foundation than the 25m diameter foundation, but I do not consider the difference to be significant in terms of the volume of construction traffic, particularly during concrete pours.

16.19.36. The Observers are concerned about the safety of the N59 for the operational traffic of the hydrogen plant. The location of the upgraded access is a point where there are clear views north and south of the N59, notwithstanding the undulating nature of the road. This enables traffic joining the N59 adequate sight visibility lines. Traffic travelling north or south at speed on the N59 have sufficient forward visibility of any turning movements. In relation to tube trailers causing traffic delays, this is the

reality for traffic on most roads in Ireland where HGVs are concerned, where few roads are dual carriages. The N59 is lacking hard shoulders, but this is not unusual for national roads. There are a number of junctions in close proximity along this stretch of road. However, there is good intervisibility and so I do not consider that the proposed development would give rise to traffic hazard. The proposed development will significantly improve the junction of the L-6612-1, while the volume of traffic using this road is very limited. The applicant has agreed that the number of tube trailer movements be limited by way of condition. I consider that the chapter, as submitted and the additional information submitted as well as the commitments made by the application at oral hearing, is satisfactory.

16.20. **Major Accidents and Disasters**

Issues Raised

16.20.1. Risk of explosion and fire.

16.20.2. Amount of hydrogen being stored.

16.20.3. Risk to workers.

16.20.4. Impacts on household insurance.

16.20.5. Ability to obtain planning permission in the future.

16.20.6. Peat stability.

16.20.7. Risk of flooding.

16.20.8. Traffic safety.

Competency of the authors

16.20.9. I am satisfied with the competency of the authors.

Context

16.20.10. The chapter refers to the legislation and guidance that has informed the contents.

Risk Assessment

16.20.11. A Preliminary Hazard Analysis (PHA) and a Technical Land Use Quantitative Risk Assessment (TLUP QRA) has been submitted by Risktec Solutions Ltd. The HSA requested the TLUP QRA to be updated in line with the latest guidance document.

This was completed. At the oral hearing, the document was revised to use a common base map. The conclusions on all three versions remain unchanged – that there are no buildings within the 1 in a million risk of fatality contour. The nearest occupied building is a milking parlour 40 metres outside of this contour. There is no societal risk emanating from the proposed hydrogen plant.

16.20.12. Table 16.14 sets out potential hazards, which have been taken from the HSE Emergency Plan Hazard Types. Included in this list is fuel transport to and from the hydrogen plant site, and fire and explosion there. Hazards in relation to the wind farm location include loss of infrastructure through extreme wind (in excess of 25m/s) and lightning strike, peat instability. Forestry close to the wind farm substation and hydrogen plant is also listed as a natural hazard.

16.20.13. Weather conditions are not expected to be a threat to the hydrogen plant, other than the impacts of driving the tube trailers in poor weather. In severe weather conditions, when the tube trailers cannot leave the site, the production of hydrogen will be shut down. In the event of dry spells, there is a back up supply of between 1.5 and 4 months.

16.20.14. Flood risk assessments have been prepared for both locations and neither location is within a fluvial flood zone. The proposed development will not give rise to flooding off site.

16.20.15. A Peat Stability Assessment has been carried out for both locations. An emergency response forms part of the CEMP.

16.20.16. During operation, a series of mitigation measures and plans to deal with emergencies for the hydrogen plant will be in place. The plant is designed to keep oxygen and hydrogen physically separate, which reduces the risk of fire. There are no inhabited dwellings within 299 m of the hydrogen plant site. It is not anticipated that an accident on site will have any significant effects on population.

16.20.17. The nearest houses and occupancy levels are described. This has been criticised by observers on grounds of loss of privacy. I understand that this is part of the risk assessment process, but I concur that perhaps for the purposes of EIAR, it may be sufficient to identify that the properties are occupied in Volume II.

16.20.18. A series of safety equipment are listed to prevent and minimise accidents. Fire fighting equipment will be in place, including sprinkler systems, carbon dioxide suppression systems and water for fire fighting purposes.

16.20.19. The wind turbine blades are glass reinforced plastic and lightning protection conduits will be installed. The final turbine chosen will comply with the International Electrotechnical Commission IEC 61400-1 safety standards.

Potential Direct Impacts

16.20.20. In the event of a fire, without mitigation, fumes from potassium hydroxide (KOH), sodium bisulphite and glycol can give rise to irritating and toxic gases, as can oils, lubricants and building materials. These would have significant adverse environmental impacts, including on air quality, surface water and aquatic ecology. It is not expected that a fire on site would impact on the forestry, as the fire is likely to be contained. Groundwater could be affected. In the event of contamination, from the hydrogen plant, the effect on soils and water would be potentially significantly negative. This would adversely affect sensitive biodiversity, including in European sites.

16.20.21. Transportation hazards could arise. This is mitigated by design and the implementation of European Directives on the inland transport of dangerous goods, such as the Transportable Pressure Equipment Directive. The cylinders are design to withstand impacts and release the gas in the event of fire, which reduces the risk of explosion. It is noted that this is considered the risk most likely to occur.

Potential Indirect Impacts

16.20.22. None stated.

Mitigation Measures

16.20.23. Mitigation can be provided, by design, avoidance, interception and through fire fighting. A detailed Emergency Response Plan will include for short and long term recovery plans. The Sligo Fire Department will continue to be engaged with Due to separation distances, the impact on air quality is likely to be temporary, small adverse.

16.20.24. The CEMP is anticipated to provide sufficient mitigation and monitoring measures, so the effectiveness of the mitigation measures will be known.

16.20.25. The ATEX Directive will apply and the *Safety, Health and Welfare at Work (General Application) Regulations* 2007 and these regulations also apply to the Hydrogen Plant.

16.20.26. Safety equipment will include leak/fire detection, emergency stops, ventilation, flow rate monitoring, impact sensors at dispensers, alarms and fire protection and suppression equipment. The volume of hydrogen will be limited on site.

16.20.27. A significant concern of observers during the oral hearing and in submissions was access for ambulances for the local population during the construction period. The applicant agreed to take measures to ensure that ambulances would not be impeded in the event of an emergency.

Potential Residual Impacts

16.20.28. The discharge from the hydrogen plant will be treated prior to release to the stream, so the residual risk is minimised.

Potential Cumulative Impacts

16.20.29. The risk of fire from the forest to the hydrogen plant has been considered and is not considered likely to affect the hydrogen plant.

Inspector's Evaluation and Conclusions

16.20.30. Please refer to Section 15.19 in relation to road safety.

16.20.31. The PHA and the Major Accident Prevention Policy has been criticised by observers as lacking in detail, as the final equipment to be used has not been identified by the applicant. This would have implications for the various safety and emergency response documents. While this may be the case, I am satisfied that this level of detail more appropriately comes within the scope of the HSA, rather than being a planning issue. The issue of hydrogen embrittlement has been identified by observers as a significant cause of accidents on a worldwide scale in hydrogen plants. This is accurate, however, embrittlement tends to arise where hydrogen is connected to a cast iron pipe network for gas transmission, on older networks. It does not arise where plastic piping is used. However the applicant has allowed for the potential of pipeline failure, which addresses the risk of hydrogen escaping, irrespective of the cause.

16.20.32. At the Oral Hearing, the applicant confirmed that all the hydrogen produced in the plant was accounted for and the proposed plant remains a Lower Tier COMAH

site. No increase in household insurance premium is expected. The consultation distance for planning applications does not prevent planning permission being granted, if no other issues come into play.

16.20.33. The risk of explosion is considered very unlikely and with limited consequences. The HSA is satisfied that siting distances have been adhered to and does not recommend against a grant of planning permission.

16.20.34. I am satisfied that the potential risks to the proposed development, in particular the hydrogen plant have been clearly identified and mitigation measures to avoid, prevent and reduce the impacts of a major accident or natural hazard have included.

16.21. Interactions of the Foregoing and a Summary of Mitigation Measures

16.21.1. The document notes that the interaction between different elements of the environment have been addressed in the chapters.

16.21.2. The mitigation measures refer to embedded mitigation i.e. mitigation at design stage, which therefore avoids most of the potentially significant effects. This involved utilising existing tracks in the wind farm location, careful siting of turbines, including the provision of buffers to sensitive receptors and maximising separation from residences.

16.21.3. The main interactions are addressed in Table 17.2. The proposed development will reduce greenhouse gases, thereby improving climate for population. This is considered a major, significant, positive effect. Impacts during construction are considered temporary and following mitigation, not significant. In relation to Major Accidents, the siting of the hydrogen plant has reduced the risk and with mitigation, it is not considered significant.

16.21.4. Biodiversity, Soils and Geology and Hydrology and Hydrogeology are interactions that could occur. Subject to mitigation, this risk is minimised.

16.21.5. The interaction between ornithology and noise is temporary and not considered significant.

16.21.6. I consider that the interactions capture the construction and operation impacts between the EIAR topics. In the Oral Hearing, it was confirmed that the ‘Worst Case Scenario’ had been tested and the mitigation measures remain effective. I am satisfied that interactions have been adequately taken account off.

16.22. Schedule of Mitigation and Monitoring Measures

16.22.1. Please note that these are contained Appendix 17.1 in Volume 4 of the EIAR. These have been set out in tabular form, numbered and capable of being implemented and monitored. There are 111 mitigation measures. A separate schedule has been provided for monitoring measures.

16.22.2. The mitigation measures and monitoring measures are detailed and considered. I am satisfied that these, if adhered to, will provide sufficient protection to ensure that significant environmental impacts are avoided, prevented or reduced to minimise impacts.

16.23. Reasoned Conclusion on the Significant Effects on the Environment

16.23.1. Having regard to the timeframe in which the EIAR was prepared, from 2022, I am satisfied that the information provided is still current.

16.23.2. The examination of the environmental information contained above in the EIAR submitted by the applicant, the written submissions on file and the Oral Hearing, I consider that the information is sufficient to allow the Board to reach a reasoned conclusion on the significant effects on the environment, taking into account current knowledge and methods of assessment.

16.23.3. During construction and decommissioning of the wind farm and construction of the hydrogen plant and associated grid connection and interconnector, the proposed development could give rise to a serious degradation in surface water, which could have a significantly adverse impact on receiving waters, which could impact on European sites and Annex II protected species, including the Freshwater Pearl Mussel and salmon and sea trout, due to poor control of surface water on site, mobilisation of peat sediments (including from peat instability) and other materials and traversing of watercourses. The mitigation measures proposed during construction in the CEMP will ensure that impacts on these waters can be managed and controlled, so as surface waters and aquatic life will not be effected by the proposed development.

16.23.4. Construction traffic will give rise to significant disruption and inconvenience on the local road network. However, this will be for a limited period of time and the proposed mitigation measures will minimise the localised impact.

16.23.5. During operation, there is risk of a major accident at the hydrogen plant. However, the risk is considered to come within the scope of an acceptable level of risk, having regard to the distance of the hydrogen plant from permanently occupied buildings, the nature of use of adjoining land and the major accident planning procedures as set out in the application.

16.23.6. During operation, there may be a high volume of abstraction of groundwater for the generation of hydrogen, which could deplete the locally important aquifer. The use of rainwater harvesting as the primary source of water supply will ensure a balance between abstraction and recharge, so that a sustainable yield may be achieved and that 'good groundwater status' is maintained. I therefore concur that following mitigation, the impact on groundwater levels and supplies are likely to be neutral to slight adverse.

16.23.7. The wind farm footprint will result in a permanent loss of peatland habitat of circa 15.3 ha. The Biodiversity Enhancement Management Area will improve local diversity and return a part of this cutaway bog to a carbon sink, but only extends to circa 10.5 ha.

16.23.8. The wind farm at operation stage, could give rise to a serious threat to bats, due to the presence of bats at high risk of collision in the vicinity of the site. The curtailment of turbines at time of high bat activity will mitigate this effect.

16.23.9. There is a threat of pollution from discharge from the hydrogen plant to pollute the Dooyeaghny Stream. However, the wastewater treatment process, including the provision of constructed wetlands, and monitoring procedures, mitigates this risk.

16.23.10. The hydrogen plant, when operational, is anticipated to remove circa 50,000 tonnes of CO^2 from diesel vehicles. This would reduce greenhouse gas emissions and would improve air quality. Over 40 years, the wind farm and hydrogen plant would lead to the displacement of between 1.6 million and 2.5 million tonnes of Carbon Dioxide from the atmosphere and would facilitate the decarbonisation of Heavy Goods Vehicles, including Public Service Vehicles in Ireland.

16.23.11. In conclusion, having regard to the above identified significant effects, I am satisfied that the works to be undertaken in the construction phase of the proposed development, will not lead to unacceptable direct and indirect effects on the environment. I am also satisfied that, subject to the implementation of mitigation

measures during operation of the wind farm and hydrogen plant and the decommissioning of the wind farm, the project will not have any unacceptable direct or indirect impacts on the environment.

17.0 **Appropriate Assessment**

17.1. The requirements of Article 6(3) as related to screening the need for appropriate assessment of a project under part XAB, section 177U and section 177V of the Planning and Development Act 2000 (as amended) are considered fully in this section. The areas addressed in this section are as follows:

• Compliance with Article 6(3) of the EU Habitats Directive

• Screening the need for appropriate assessment

• The Natura Impact Statement and associated documents

• Appropriate Assessment of implications of the proposed development on the integrity each European site

17.1.1. *Compliance with Article 6(3) of the Habitats Directive*

17.1.2. The Habitats Directive deals with the Conservation of Natural Habitats and of Wild Fauna and Flora throughout the European Union. Article 6(3) of this Directive requires that any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. The competent authority must be satisfied that the proposal will not adversely affect the integrity of the European site before consent can be given. The proposed development is not directly connected to or necessary to the management of any European site and therefore is subject to the provisions of Article 6(3). The requirements of Article 6(3) as related to screening the need for appropriate assessment of a project under part XAB, section 177U of the Planning and Development Act 2000 (as amended) are considered fully in this section.

Screening the need for Appropriate Assessment

17.1.3. The development is not directly connected with or necessary to the management of any European Site. The applicant has submitted a report '*Proposed Firlough Wind Farm and Green Hydrogen Plant Screening for Appropriate Assessment and Natura Impact Statement'* by BioSphere Environmental Services (BES). I am satisfied with the competency of the person who prepared the report.

17.1.4. The report provides a description of the proposed development and baseline ecological environment. The company have been involved on the site since 2019. The screening report has been prepared on the basis of the absence of mitigation measures.

17.1.5. The European Sites within a possible zone of influence of the proposed development are identified, within a 15km radius of the site or further if there are potential pathways of connectivity. Ecological pathways considered include hydrological connections between the wind farm development and receiving watercourses / wetlands and also resource connections, where birds associated with SPA sites may utilise the site or pass through on flight paths between other SPA sites. Various bird surveys have been undertaken, to assess if bird species recorded at the site are connected with a European site. From this, the likely zone of impact is derived. I undertook a review using the EPA Appropriate Assessment tool on 05.04.2024 and confirmed that the SACs and SPAs that are identified are:

Table 3: European Designated Sites for Screening Assessment

Name	Site Code	Approximate Distance	Qualifying Interests	Connection
Ox Mountains SAC	002006	0.1 km	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with	Yes – ecological continuity and hydrological connection from wind farm location.

			Erica tetralix [4010] European dry heaths [4030] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the Rhynchosporion [7150] Vertigo geyeri (Geyer's Whorl Snail) [1013] Saxifraga hirculus (Marsh Saxifrage) [1528]	
Lough Hoe Bog	000633	2.5 km	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110] Blanket bogs (* if active bog) [7130] Vertigo geyeri (Geyer's Whorl Snail) [1013] Austropotamobius pallipes (White-clawed Crayfish) [1092]	No
Killala Bay / Moy Estuary SAC	000458	3.5 km	Estuaries [1130] Mudflats and sandflats not covered by	Yes – hydrological link for all four elements of the project.

			seawater at low tide [1140] Annual vegetation of drift lines [1210] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] Petromyzon marinus (Sea Lamprey) [1095]	

			Phoca vitulina (Harbour Seal) [1365]	
Killala Bay / Moy Estuary SPA	004036	3.5 km	Ringed Plover (Charadrius hiaticula) [A137] Golden Plover (Pluvialis apricaria) [A140] Grey Plover (Pluvialis squatarola) [A141] Sanderling (Calidris alba) [A144] Dunlin (Calidris alpina) [A149] Bar-tailed Godwit (Limosa lapponica) [A157] Curlew (Numenius arquata) [A160] Redshank (Tringa totanus) [A162] Wetland and Waterbirds [A999]	Yes – hydrological links for all four elements of the project.
River Moy SAC	002298	6 km	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510] Active raised bogs [7110] Degraded raised bogs still capable of natural	Yes – hydological connection with the wind farm, interconnector cable and Grid Connection Route.

			regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150] Alkaline fens [7230] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] Austropotamobius pallipes (White-clawed Crayfish) [1092] Petromyzon marinus (Sea Lamprey) [1095] Lampetra planeri (Brook Lamprey) [1096] Salmo salar (Salmon) [1106] Lutra lutra (Otter) [1355]	
Lough Nabrickleagh Bog SAC	000634	7 km	Blanket bogs (* if active bog) [7130]	No – no hydrological or ecological connection

Lough Conn and Lough Cullin SPA	004228	23.5 km	A061 Tufted Duck Aythya fuligula A065 Common Scoter Melanitta nigra A182 Common Gull Larus canus A395 Greenland White-fronted Goose Anser albifrons flavirostris	Species not identified in bird surveys so no ex-situ effects arise

17.1.6. I note that the screening report considered two other sites, Knockalongy and Knockachree Cliffs SAC (Site Code: 001669) and Lacken Saltmarsh and Kilcummin Head SAC, (000516) but did not assess these any further as there was no source-path-receptor connection between the European sites and the subject site. I concur with this finding.

17.1.7. The proposed development is not in a European Site, so no loss of habitat located therein is likely to arise. The proposed development is within 100 metres of the Ox Mountain SAC and there is ecological connection between the sites, due to the continuation of the cutover blanket bog habitat. A tributary of the Gowlan River rises on site, heads north and passes through the Ox Mountain SAC. Other than the proposed wind farm, the rest of the project has no connection to the Ox Mountain SAC.

17.1.8. Having regard to the Qualifying Interests of the SAC, I am satisfied that there is no direct disturbance to species (Vertigo geyeri, being found by lake shores, would not be affected).

17.1.9. While there are 6 no. European sites potentially affected, Dr. Flynn and I would concur with the finding that there are 4 European sites which might be affected by impacts generated the proposed development, namely:

- Ox Mountains SAC,
- Killala Bay / Moy Estuary SAC,
- Killala Bay / Moy Estuary SPA and
- River Moy SAC.

All are connected via surface water and their qualifying interests could be affected by changes in water quality and quantity. The Ox Mountains, as stated above, has an ecological connection.

17.1.10. The screening report considers the impacts of the differing turbine parameters and considers the impacts on birds and bats in terms of collision risk. The impact on habitat is considered from the parameter of the largest turbine base.

17.1.11. A number of impacts are listed that have the potential to result in significant effects on the European Sites. The impacts could arise in construction and operational phases from pollution, via the surface water drainage. In the absence of mitigation measures there could be impacts on the attainment of conservation objectives of the European sites. The impact of the proposed wind farm on the Ox Mountains SAC from an ecological perspective is ruled out, as it is considered that the site for the proposed development is already reducing water levels in the adjoining bog, due to the existing drainage channels. However, it is brought forward for detailed assessment.

17.1.12. The report concludes that in the absence of implementation of suitable mitigation, during construction and operation, the proposed development could pose a risk of likely significant effects. An Appropriate Assessment is considered warranted. Dr. Flynn and I would concur with the above assessment.

In-combination Effects

17.1.13. The report did not consider cumulative effects with other projects in the area at screening stage, but did address it in the NIS and at the oral hearing, in terms of worst case scenario. There could be a cumulative risk arising, having regard to the two single turbines and grid connection that have been permitted in the area.

Screening Determination

17.1.14. The proposed development was considered in light of the requirements of Section 177U of the Planning and Development Act 2000 as amended. Having carried out a Screening for Appropriate Assessment of the project, and having regard to the information presented in the *Screening for Appropriate Assessment and Natura Impact Statement*, submitted with the application, including the nature, size and location of the development and its likely direct and indirect effects, either alone or in combination with other plans or projects, it is considered that potential significant effects could arise and that Appropriate Assessment is required to determine if adverse effects on site integrity can be excluded from the following European Sites, in light of the Conservation Objectives for those Sites:

- Ox Mountains SAC, Site Code: 002006,
- Killala Bay / Moy Estuary SAC, Site Code: 000458,
- Killala Bay / Moy Estuary SPA, Site Code: 004036 and
- River Moy SAC, Site Code: 002298

Natura Impact Statement (NIS)

17.1.15. The NIS sets out the conclusions of the Appropriate Assessment Screening Report, describes the potential effects on the relevant European sites project, the receiving environment, assesses potential effects and associated mitigation, analyses in-combination effects, assesses residual and cumulative effects and provides a concluding statement. It identifies and characterises the possible implications of the development on the European sites, in view of the site's conservation objectives, and provides information to enable the Board to carry out an appropriate assessment of the works undertaken and proposed to be taken. Dr. Flynn and I consider the information sufficient to allow the Board undertake an Appropriate Assessment.

17.1.16. The NIS cross references relevant EIAR chapters and appendices, including Chapter 9, which considers hydrology. The following appendices informs the findings and mitigation measures:

- Construction and Environmental Management Plan,
- Surface Water Management Plan,
- Water quality Management Plan,
- Watercourse Crossing Plan,

17.1.17. The NIS assesses the potential for direct, indirect effects, alone or in combination with other plans and projects, taking into account the use of mitigation measures to prevent impacts. Dr. Flynn is satisfied that best scientific information and knowledge has been employed to determine implication in view of the conservation objectives of the European sites.

Potential Effects on Ox Mountains SAC

17.1.18. Direct impacts on the SAC are ruled out due to the separation distance between the SAC and the proposed development (100m to site boundary and 27 m to the

nearest turbine, T1) and because the wind farm location is already hydraulically impacting on the SAC.

17.1.19. Indirect impacts could arise from the tributary to the Gowlan River, which flows for circa 2.5km before entering the SAC, could carry contaminants during construction, operation and decommissioning. The blanket bog and associated peatland habitats could be adversely effected if the stream was in flood carrying contaminants, affecting the pH and nutrient status.

17.1.20. The NPWS Conservation Objectives for the SAC are dated 2016. The Conservation Objectives overall seek to maintain habitats and species in a favourable conservation condition, which will contribute to the overall maintenance of favourable status of the habitats and species at a national level. There are nine Qualifying Interests. However, only three could be effected by the proposed development. These are wet heaths, blanket bogs and Rhynchosporian vegetation. Their relevant attribute is an ecosystem function, which rely on soil nutrients to remain within natural ranges. The habitats are distributed through the site. The NIS notes on Page 32 that "*The deposition of pollutants, and especially cementitious materials, and nutrients, into peatland soils along the river channel could alter nutrient status and pH of the peat soil".* This effect is considered to be potentially Significant.

Potential effects on Killala Bay/Moy Estuary SAC and SPA

17.1.21. The SAC and SPA are largely overlapping in area. The Conservation Objectives for the SAC was set out in 2012 and is about maintaining favourable status of habitats and species. The Conservation Objectives for the SPA was set out in 2013 and are similar to the SAC.

17.1.22. There are no direct impacts anticipated, but indirect impacts could arise due to the hydrological connections, via the Glenree / Brusna river system and the Dooyeaghny River. These could arise during construction, operation and decommissioning.

17.1.23. During construction, suspended solids and nutrients, cementitious material and hydrocarbons could be released into receiving waters, particularly during watercourse crossings. The clear-fell of conifers could release nutrients. The proposed wind farm will have chemicals stored on site and operations could generate suspended solids if peat surfaces are disturbed. During operation, the proposed hydrogen plant could

have significant potential for adverse effects on the Dooyeaghny River and in turn, on the European sites. This arises from the chemicals that would be stored on site. These chemicals include Potassium hydroxide (KOH) for the electrolysis process (lye), Sodium bisulphite for de-chlorination of mains water, should it be used for process, Antiscalant used to prevent/reduce scaling of water treatment equipment, and Glycol for coolant. The lye and glycol are to be used in the closed loop electrolysis process and are not part of the wastewater stream. Sodium bisulphate will only be required if mains water is used. This substance is very dangerous to fish in large quantities, but the volumes are likely to be less than 5 mg/l. It is regularly used in the treatment of drinking water supplies. Antiscalents will be used.

17.1.24. The qualifying interests of the SAC likely to be effected by the proposed development due to pollution are Estuaries [1130], Mudflats and sandflats not covered by seawater at low tide [1140] and *Petromyzon marinus* (Sea Lamprey) [1095]. I note that observers consider that the *Vertigo angustior* could be affected by a reduction in groundwater. This snail is generally found on the coast, in the transition zone between wetter and drier habitats and in this case, in a marsh near Killanly. Given the extent of the Zone of Contribution around the boreholes of the hydrogen plant, I consider that the separation distance would ensure that if groundwater plays a role in the coastal marshes, that there would not be a significant effect. The *Phoca vitulina* is a seal and unlikely to be effected by the contaminants.

17.1.25. The qualifying interests of the SPA – the birds listed Table 3, could be effected indirectly by a reduction in biotic diversity and toxicity from invertebrates.

Potential Effects on the River Moy SAC

17.1.26. The Conservation Objectives were set out in 2016. Again, the overall aim is to maintain or restore the favourable conservation status of habitats and species. The qualifying interests that could be effected by the proposed development are Petromyzon marinus (Sea Lamprey) [1095], Lampetra planeri (Brook Lamprey) [1096], Salmo salar (Salmon) [1106] and Lutra lutra (Otter) [1355]. Both lampreys and salmon require clean gravels for spawning. Sediment loading could effect the spawning habitat. It could also result in a decline in aquatic invertebrate communities and aquatic macrophytes, and the food resource for fish and consequentially their predators, including otters. Suspended solids could hold nutrients that result in

eutrophication, reduced oxygen levels. Pollution events could poison fish and invertebrates.

Mitigation Measures

17.1.27. During the construction phase, mitigation measures need to avoid, minimise and control contaminated run-off from entering watercourses. The specific mitigation measures are set out in the CEMP and Schedule of Mitigation Measures. A site specific emergency plan has been prepared to deal with accidental spillage and other events.

17.1.28. Mitigation by avoidance has also been adopted. Turbine locations and key infrastructure are set back from watercourses by a minimum of 65 metres. The existing internal road network in the wind farm location will be utilised and upgraded, with only one new section of internal road and a new entrance required.

17.1.29. Appropriate working practices, overseen by an Ecological Clerk of Works, will ensure that drainage measures will protect receiving waters, as set out in the CEMP and relevant surface water management plans. Measures include segregating clean water, check dams, settlement ponds, silt busters and buffered outfalls. Water crossings will only be carried out in dry weather, between July and September. A vegetation restoration project on disturbed peat surfaces will use saved sods of bog reinstated and reseeding of bare surfaces with suitable plants. Daily monitoring of sediment traps and settlement ponds will be undertaken. No concrete batching will take place on site.

17.1.30. The risk of peat or soil movement will be minimised through measures to avoid this and good practice. Emergency response measures will be in place.

17.1.31. The Horizontal Directional Drilling will use ‘Clearbore’ which is environmentally friendly.

17.1.32. Similar measures will be implemented at decommissioning phase.

17.1.33. During operation, wastewaters at the wind farm will be stored and tankered off site to the wastewater plant in Ballina.

17.1.34. The wastewater at the proposed hydrogen plant will be subject to a discharge licence from the EPA. The hydrogen process wastewater and welfare wastewater will be treated separately, in two constructed wetlands before being combined for

discharge. The discharge must meet Environmental Quality Standards for surface water.

17.1.35. In the event of a major accident, chemicals will be intercepted by drainage and surface water networks. The watsewater storage tank can hold 1,500 m^3 so that discharge can be stopped entirely. Firewater can be pumped out and tankered off-site. Chemicals will be stored in a bunded area and quantities will be minimised.

In-combination Effects

17.1.36. These have been considered in terms of the existing wind farms in the area and relevant planning permissions. These projects have been assessed and mitigation measures have been implemented or are prosed. No in-combination cumulative effects are likely to arise.

Evaluation of Effects

17.1.37. Dr. Flynn considers that the IFI concern for Salmon in particular. She considered that the proposal will not interfere with or delay the attainment of conservation objectives, or add to the threats and pressures already being exerted on the European sites. She notes that the applicant has committed to applying measures requested by the IPI, to protect the fisheries value of the watercourses.

17.1.38. In Dr. Flynn's memo, in relation to the Ox Mountains SAC, the mitigation measures proposed by the application will prevent pollution entering the Gowlan stream. This will ensure that wet heath, blanket bog or Rhynchosporain vegetation will not be affected.

17.1.39. Dr. Flynn considers that the risk of adverse effects on four qualifying interest species in the River Moy SAC has been identified (Sea Lamprey, Brook Lamprey, Salmon and Otter). The qualifying habitats present in the European site are outside of any zone of influence.

17.1.40. The Killala Bay / Moy Estuary SAC and SPA habitats that are at risk from the proposed development are Estuaries, Mudflats and sandflats not covered by seawater at low tide) and one species (Sea Lamprey). Dr. Flynn is satisfied that the rest of the habitats and species can be ruled out. In relation to the Narrow-mouthed Whorl snail *Vertigo angustior,* she notes that the applicant has not overlooked impacts on this

species and that the justification presented in the response document is considered adequate.

17.1.41. I consider that the mitigation measures are extensive, are clearly described, are reasonable, practical and enforceable. It is reasonable to conclude on the basis of best scientific information, that the proposed development would not be give rise to have an adverse effect on the integrity of the Ox Mountains SAC, The River Moy SAC, Killala Bay/ Moy Estuary SAC and SPA and that adverse effects on site integrity can be excluded. On the Gowlan River, the mitigation measures will protect the Freshwater Pearl Mussel.

NIS Omissions

17.1.42. No omissions were identified.

Appropriate Assessment Conclusion

17.1.43. Having reviewed the NIS and the supporting documentation, and taking into account the evaluation of the Inspectorate Ecologist, I am satisfied that the applicant has provided adequate information in respect of the baseline conditions, clearly identifies the potential impacts, and uses best scientific information and knowledge in assessing those impacts. I am satisfied that the information is sufficient to allow for complete, precise and definitive findings for the appropriate assessment of the development. the development, individually or in combination with other plans and projects would not adversely affect the integrity of the European Sites:

- Ox Mountains SAC, Site Code: 002006,
- Killala Bay / Moy Estuary SAC, Site Code: 000458,
- Killala Bay / Moy Estuary SPA, Site Code: 004036 and
- River Moy SAC, Site Code: 002298.

17.1.44. I consider that the scientific information and assessment presented in the NIS is adequate to ensure that all aspects of the project can be assessed by the Board and provides for complete, precise and definitive findings for the purpose of Appropriate Assessment.

18.0 Planning Assessment

18.1. Principle of Development

18.1.1. The planning history of the wind farm location is that a wind farm has been permitted there previously and was extant when the application was lodged. Since the grant of permission, there has been major developments in policy terms in regard to renewable energy and energy security at international, national level and regional levels. The momentum is towards increased policy support for renewable energy at international, national, regional and local level – please see Section 5 of this report. The site is located in a Tier 1 Preferred (Large Wind Farm) in the Mayo County Development Plan. REO 23 supports the achievement of 600MW of renewable energy for Mayo over the plan period. Therefore, the proposed wind farm is acceptable in principle.

18.1.2. The DAU have referred to peatlands policy in Mayo County Development Plan 2022-2028 and questions how the continuation of turf cutting within the site, complies with the policy of protection and restoration of peatland areas. I do not consider that the applicant has the legal right to prevent turf cutting outside of the Biodiversity Enhancement Management Area. I am satisfied that the applicant is complying with the policy within areas where such control can be exerted.

18.1.3. The proposal for a hydrogen plant is a relatively new technology in a Republic of Ireland context. The observers contend that there is no market for hydrogen at present and so the hydrogen element is premature. I am aware that a demonstration project has been permitted in Mount Lucas, Co. Offaly, for Bord na Mona which would generate 200,000kg or 2MW of hydrogen from its wind farm at this location. A hydrogen plant has been permitted in Mayo County Council at Bellacorick and would generate 1,667 kg/hr (which equates to 14.6 million kg/yr, approximately 1,622 MW per annum, or roughly three times the output of the proposed hydrogen plant). An application for a demonstration project has been made in the Aghada Power Station in County Cork for the ESB (24/4026) for 1 MW of hydrogen.

18.1.4. There is an operating hydrogen plant in Northern Ireland, as referred to by the applicant. Energia Group are producing hydrogen from their wind farm at Long Mountain Wind Farm in County Antrim. Wind energy is converted to hydrogen using a 1MW electrolyser. It is compressed on site and transported to Belfast to power double decker buses at Milewater Bus Station. Wrightbus manufacture a hydrogen fuel cell

single and double decker buses in Ballymena. The website states that Wrightbus are in the process of seeking planning permission for a hydrogen production plant at their plant in Ballymena (in a built up area), which should produce enough hydrogen to run up to 300 buses. From the above information, I am satisfied that there is an emerging market for hydrogen powered vehicles. Confirmation was provided at the oral hearing of the purity of the hydrogen to make it suitable for fuel cell technology. The applicant stated that the majority of buses and HGVs will operated at 350 to 400bar and this will be the market. I note that Wrightbus operate at 350bar for their buses.

18.1.5. The proposed hydrogen plant in this application is located in Sligo. While there is no reference to hydrogen production in the current Sligo County Development Plan, there is policy support for rural resource based enterprise, including energy production, subject to normal planning considerations (P-RDD-1). Energy production sometimes resembles industrial development, so there is recognition within the policy, that this activity once its based on a rural resource, can take place in a rural area. The wind farm, while not in Sligo, is based in a rural area. Therefore, in principle, the location of the hydrogen plant in a rural location is not contrary to Sligo planning policy. This was confirmed at the oral hearing, which Sligo County Council attended.

18.1.6. P-CAM-4 states that the planning authority will facilitate and assist in Sligo's transition to a low-carbon economy and society. The production of hydrogen as a replacement fossil fuel for transportation, is consistent with this policy.

18.1.7. The draft *Sligo Development Plan, 2024-2030*, refers to green hydrogen as an opportunity. It supports the development of an energy industry, which includes generation, transmission, storage and distribution infrastructure.

18.1.8. Observers consider that the location of an industrial plant in a rural location is contrary to planning policy, as one would expect such facilities to be located in an urban, industrially zoned area. The planning authority considers that the provision of the hydrogen plant is consistent with national, regional and local planning policy. I do not consider that the development plan limits industrial development, particularly one reliant on a rural resource base, to urban areas. I am satisfied that there is no local policy impediment to the location of the hydrogen plant in a rural area.

18.1.9. The EU regards green hydrogen as necessary to reach carbon neutrality, particularly in the transport sector. 6 GW of green hydrogen is expected to be delivered by the

end of 2024 and 40 GW by 2030. The proposed development is consistent with this policy.

18.1.10. The *National Hydrogen Strategy* 2023 also considers that the production of hydrogen in Ireland is necessary, for energy security and to enable the substitution for fossil fuels when electrification is not feasible or cost effective and is suitable for storing energy and as a backup for renewables.

18.1.11. Further policy support is provided for the production of green hydrogen is provided for in the *Climate Action Plan* 2024 and *the Renewable Transport Fuel Policy* 2023-2025.

18.1.12. Observers have made a number of points in relation to wind and hydrogen energy. They argue that wind energy is not suitable because of its unreliability and recommend that deep core geothermal energy should be used, as it does not suffer from this problem. That energy always dispatchable. I note that Iceland is the world leader in relation to this energy form, using it mostly in building heating. However, Iceland still requires fossil fuels for its transport sector. Renewable hydrogen is an alternative to fossil fuels in transport. Therefore, the proposed development, which would facilitate the generation of hydrogen for transport and high intensive carbon uses, is necessary for particular purposes, that deep core geothermal energy has not been able to provide for to date.

18.1.13. The *National Hydrogen Strategy* 2023 sets out how the Department of Environment, Climate and Communications expect the hydrogen industry to develop in Ireland from 2023 to 2050. It considers that from the outset, green hydrogen should be produced from curtailed grid electricity or onshore renewables where available. It is to be transported by tucks or uses on site initially. Storage is anticipated to be small scale initially. Heavy land transport is expected to be the first end users. The proposed development is consistent with this approach – generating hydrogen when electricity is curtailed, transporting it by truck, storing it on a small scale basis (large scale being a geological solution) and using hydrogen to power heavy vehicles.

18.1.14. Observers have stated that the location of the proposed development is not appropriate, having regard to the *National Hydrogen Strategy.* Save for limited references to ports or energy parks for data centres, there is little in the document that identifies potential locations for hydrogen infrastructure. This is appropriate, as the

strategy has not been subject to SEA, as identified by the observers. The strategy, unlike, for example, the *Urban Development Building Height Planning Guidelines*, does not set out appropriate locations for hydrogen plants or parameters for the granting or refusal of planning permission. The *National Hydrogen Strategy* is more of a roadmap, than a plan. Its value, in relation to this application, is to confirm that hydrogen production is to become an important part of Irish energy.

18.1.15. The strategy states that before 2030, the hydrogen sector is envisaged to focus on small scale decentralised applications, with compressed tankering the most viable solution for transport and storage. During the 2030's, initial clusters are expected near ports. Large scale infrastructure will emerge during this time period and further studies are required to determine what these should be and where they should be located.. The *National Energy Security Framework*, similarly identifies that there is a need to develop hydrogen production, so as Ireland can diversify away from fossil fuels for energy security.

18.1.16. There is general support for renewable energy and the need to maximise its value and support industry in the RSES for the North and Western Region.

18.1.17. I am satisfied that that there is EU, national, regional and local policy support for the development of hydrogen production. Sligo County Development Plan policy P-RDD-1 facilitates energy production in a rural area. The draft Sligo County Development Plan is also support of 'green' hydrogen. Therefore, subject to detailed assessment, I consider that both the proposed hydrogen, wind farm and associated infrastructure are acceptable in principle.

18.2. **Traffic Safety**

18.2.1. I note that Observers state that no consent has been given to the applicant to maintain sightlines. I am aware that under the Roads Act, 1993, landowners are obliged to take all reasonable care to ensure that vegetation is not a danger to people using or working on a public road and that liability for damage arising from that hazard rests with the landowner/occupier. I am satisfied therefore, that once adequate sight lines are available, which in this case is 215 metres, that the upgraded junction can be accessed safely.

18.2.2. Observers are concerned about the volume of HGVs that would be generated by the hydrogen plant. The applicant has referred to a maximum of 52 HGV movements a

day. Observers point to the absence of availability of tube trailers of the size referred to in the documents submitted and that the volume of HGV movements generated will be significantly more. I would concur that a higher volume of truck movements is likely at the outset of operation, but with a growing hydrogen production industry, larger tube trailers will become available to ensure economies of scale. At the oral hearing, the applicant committed to limiting the number of HGV movements to 52 per day. This can be conditioned.

18.2.3. There is a general presumption against the generation of increased traffic from existing accesses onto national roads where speeds greater than 60 kph apply. The speed limit of 100 kph applies at this location on the N59. TII acknowledges that in this instance, the access for the hydrogen plant is not directly onto the N59. I would also consider that the transportation of hydrogen for the purposes of fossil fuel replacement, would contribute to the reduction of traffic generated greenhouse gases and so would be consistent with the *Climate Action Plan* and would contribute to socio-economic development and is strategic for climate change. Therefore, the nature of the traffic is consistent with the purpose of the road network. I would therefore differentiate between this type of traffic and traffic generated from a rural house exiting onto the national route network. TII suggests that the location be identified in the draft county development plan. Having regard to the nature of the proposed development, that would have been highly contentious.

18.2.4. TII has requested a design report from the applicant for the alterations to the N59. This has been received. I am satisfied that the upgraded access will function effectively, that traffic will not cross over the white line when turning and the alterations will improve road safety at this location. I note that Observers referred to road accidents along this stretch of road, due to driver speed and frustration with slower moving traffic. These concerns are valid, but they relate to driver behaviour. The revised access design complies with the physical parameters for a road of this nature.

18.3. **Development Potential**

18.3.1. Coillte are a neighbouring landowner and four turbines (T3, T4, T5 and T6) come within 155m to 226m from Coillte's boundary. The *Wind Energy Development Guidelines* 2006 refer to a distance of not less than two rotor blades from a property boundary will

generally be acceptable, unless by written agreement of adjoining landowners for a lesser distance. Reference is made to a Circular from the Department of Environment (PD 6/06), that stated that two rotor blades are to be read as two rotor blade diameters. To achieve this, the proposed wind turbines would have to be 298m from Coillte's boundaries.

18.3.2. The applicant notes that the original wording is repeated in the *Draft Wind Energy Development Guidelines* 2018 – that rotor blades rather than rotor diameter is involved. Furthermore, in the UK, this recommendation on distance is reduced to one rotor blade. Two rotor blades would be a distance of 155m, which the application complies with. The purpose of the separation distance is to preserve the development potential of the Coillte lands. The applicant states that due the proximity of housing to these lands, that development potential cannot be realised.

18.3.3. In addition, the applicant points to case law, which indicated that the duty of decision makers is to have regard to Section 28 guidelines, but are not bound by them.

18.3.4. I concur that the obligation is to have regard to Section 28 guidelines, as the 2006 Guidelines predate Specific Planning Policy Requirements, which the Board must implement in the performance of its functions.

18.3.5. The reference to two rotor blades in the guidelines is for the purpose of optimal performance. I am not inclined to make a finding on the development potential of an adjoining piece of land, which is not before the Board. However, I do not consider that the location of the proposed turbines would prejudice the development of the Coillte lands for a similar type of development.

18.3.6. A number of observers are concerned that they will not be able to build homes on family land due to the proposed hydrogen plant. The applicant's response that future potential dwellings will not be impacted by safety contours. I note that every application will be decided on its own merits and the circumstances pertaining at the time.

18.4. Duration of Permission

18.4.1. The applicant has requested a 10 year permission for development. Having regard to the State's need to achieve binding renewable energy targets by 2030, I am not inclined to allow for the permission to be implemented longer than 6 years. This would allow for supply chain issues, the need for a licence from the EPA for the hydrogen

plant or any other reason as to why there may be a delay in implementing the permission.

18.5. Legal Ownership

18.5.1. A number of submissions have referred to legal ownership of roads. This relates to the visual splay lines on the N59, the construction of passing bays and the rights to lay cables in roads. Section 5.13 of the *Development Management Guidelines*, 2007, states that

'*The planning system is not designed as a mechanism for resolving disputes about title to land or premises or rights over land; these are ultimately matters for resolution in the Courts. In this regard, it should be noted that, as section 34(13) of the Planning Act states, a person is not be (sic) entitled solely by reason of a permission to carry out any development*'.

This is a matter for the applicant to ensure that they have the right to develop the indicated lands.

18.5.2. As regards the rights to lay cables, Article 22 (2) (g)(ii) of the *Planning and Development Regulations*, 2001, as amended, allows where the applicant is not the legal owner of the public road, written confirmation that the proposed development concerned is to be undertaken by a statutory undertaker having a right or interest to provide services in connection with the proposed development, applies. The applicant is such a statutory undertaker, so I am satisfied that there are sufficient legal right to undertake this element of the works.

18.5.3. Reference has been made to the location of a material spoils area located at the wind farm, which an Observer has stated this has not been consented. Again, I draw attention to Section 34 (13) of the Planning and Development Act, as amended, that the grant of planning permission does not give one the right to develop the permission.

18.5.4. The interference with turbary rights has been raised by Observers. The applicant's legal team has stated that they have the consent of the landowners and from 97 owners of turbary rights within the development footprint of the windfarm. Landowner consent is the test for planning applications, in my opinion.

18.6. Community Benefit

18.6.1. I am satisfied that the community benefit can be administered as set out by the Department of Environment, Climate Change and Communication. I do not consider that the offer of community benefit has inhibited debate on the project.

18.7. Consultation Process

18.7.1. From the observations received and submissions made at the Oral Hearing, there was significant disquiet about the consultation process. I note that the project changed midway from the hydrogen plan being located at to the wind farm location, to its current location. People who may have originally not been concerned about the project were then faced with a major change. The consultation process for those would have appeared significantly shorter than the applicant had intended. Concern was expressed that the community benefit offered would have induced support, or reduced opposition. Some expected a more personal and formal process, in terms of contact. Particular pain was felt by some for being excluded from an informal local meeting.

18.7.2. I consider that the consultation process, which began during Covid 19, via Virtual Information, was wide ranging, with a clear intent of informing the public of the project. The consultation process was non-statutory, but was carried out in a way consistent with the recommended consultation approach of the energy industry. The statutory consultation process began with the applicant's application and there have been several rounds of submissions and advertising, as well as an oral hearing. I am satisfied that the issues have been well aired.

18.8. Unauthorised Development

18.8.1. The Observers allege that an unauthorised road was constructed on the hydrogen plant site and that this was removed after Sligo County Council intervened. In the interest of clarity, An Bord Pleanála has no role in enforcement.

19.0 Conclusion

19.1. The proposed development is consistent with climate change policy and would aid in achieving the transition to a net-zero economy as well as increasing energy security and resilience. The risks associated with the proposed development have been addressed. The proposed development would not give rise to serious injury to visual or residential amenity, would be acceptable in terms of traffic impacts and would otherwise, be in accordance with the proper planning and sustainable development of the area.

20.0 Recommendation

20.1. I recommend that planning permission for the proposed development be granted, subject to condition.

21.0 Comments on Conditions

21.1. Please note that in relation to conditions, the operation of the hydrogen plant will be subject to an IED licence from the EPA and may be subject to an abstraction licence from the agency. Therefore, the conditions set out below reflect this.

21.2. I note that Mayo County Council submitted conditions to be considered in the event of a grant of planning permission. I have reviewed the conditions and many come within the scope of the mitigation measures as set out in the EIAR, which is subject to a single condition. However, I have included some conditions below. I have also included a financial contribution for Sligo County Council.

22.0 **Reasons and Considerations**

In coming to it's decision, the Board had regard to the following:

a) The National Planning Framework – Ireland 2040,

b) The Climate Action Plan, 2024,

c) Directive (EU) 2023/2413 of the promotion of energy from renewable sources (RED III), in particular the requirement for the State to set targets for the transport sector to utilise non-biological renewable fuel sources by 2030,

d) Section 15 of the Climate Action and Low Carbon Development (Amendment) Act, 2021,

e) The *National Energy Security Framework*, 2022, which prioritises the development of a hydrogen strategy to reduce reliance on fossil fuels, due to the risk of security of supply,

f) The *National Hydrogen Strategy*, 2023, which provides guidance on how the hydrogen industry may develop in Ireland in the future, but which does not provide a framework for decision making in land-use planning,

g) The Environmental Impact Assessment Directive (Directive 2014/52/EU), as amended, on 6.04.2014, on the assessment of the effects of certain public and private projects on the environments,

h) The EU Habitats Directive (92/43/EEC);

i) The European Union (Birds and Natural Habitats) Regulations, 2011-2015.

j) The likely consequences for the environment and the proper planning and sustainable development of the area where the proposed development is located and the likely significant effects of the development on European Sites.

k) The conservation objectives, qualifying interests and species of conservation interest in the Ox Mountains SAC, Site Code: 002006, Killala Bay/ Moy Estuary

SAC Site Code: 000458, Killala Bay / Moy Estuary SPA, Site Code: 004036 and River Moy SAC, Site Code: 002298,

l) The *Water Framework Directive*, 2000/60/EC,

m) The "*Wind Energy Development Guidelines – Guidelines for Planning Authorities*", issued by the Department of the Environment, Heritage and Local Government, in 2006,

n) The "*Draft Revised Wind Energy Development Guidelines*", issued by the Department of Housing, Planning and Local Government, in 2019,

o) Regional Spatial and Economic Strategy for the Northern and Western Region, 2020;

p) Mayo County Development Plan, 2022-2028,

q) Sligo County Development Plan, 2017-2023, as extended and Drafty Sligo County Development Plan, 2024-2030,

r) Water Environment (Abstractions and Associated Impoundments) Act, 2022, and the volume of groundwater abstraction required by the proposed development,

s) The submissions made in connection with the application, including the HSA and IFI,

t) The nature and extent of the proposed works, as set out in the application and oral hearing,

u) The distance of both the proposed wind farm and hydrogen plant from dwellings and other sensitive receptors,

v) The impact on residential amenity,

w) The report and recommendation of the person appointed by the Board to make a report and recommendation on the matter, including the report from the Board's ecologist.

Environmental Impact Assessment

In compliance with Section 172 of the Planning and Development Act, 2000, as amended, the Board completed an Environmental Impact Access of the proposed development, taking into account:

a) The nature, scale and location of the proposed development;

b) The Environmental Impact Assessment Report, as amended at the oral hearing, and associated documentation submitted in support of the application,

c) The submissions from the applicant, the planning authorities, the observers and prescribed bodies, during the course of the application, and

d) The Inspector's report, which includes a report from the Board's ecologist.

The Board considered that the Environment Impact Assessment Report (EIAR), supported by the information submitted by the applicant, identifies and adequately describes the direct, indirect and cumulative effects of the proposed development on the environment. The Board is satisfied that the information contained in the EIAR, complies with the provisions of EU Direct, 2104/52/EU, amending Directive 2011/92/EU.

The Board agreed with the summary and examination, set out in the Inspector's report, of the information contained in the EIAR and associated documentation submitted by the applicant and submissions made in the course of the application. The Board is satisfied that the Inspector's report sets out how these were addressed in the assessment and recommendation (including environmental conditions, save in relation to matters which come within the scope of the

Environmental Protection Agency), which are incorporated into the Board's decision.

During Construction:

The Board considered the:

- Risk of pollution of surface waters and the indirect risk to biodiversity, in particular, the Freshwater Pearl Mussel, salmon and sea trout, arising from mobilisation of peat, peat erosion and poor sediment control;

- The impact of construction traffic on the local road network.

These would be mitigated by the implementation of measures set out in the EIAR and as agreed in the Oral Hearing, with specific provisions relating to

construction environmental management mitigation measures, including traffic control.

- Positive impacts on populations and human health on the local economy from increased spending and jobs during the construction period.

Any adverse impacts on population and human heath would be mitigated by the measures to reduce impacts from material assets, air and climate and noise and vibration to acceptable levels.

During Operation

The Board considered the:

- Risk of a major accident,
- The volume of groundwater to be abstracted,
- Risk to protected species, in particular, bats and aquatic biodiversity'
- Visual impact of the wind turbines on the landscape
- Traffic impacts of the hydrogen plant on the N59.

These are to be mitigated by the implementation of measures set out in the EIAR, including the Major Accident Prevention Policy, the reliance on rainwater harvesting as the primary water source for the hydrogen plant and curtailment of the wind turbines under certain conditions.

The Board considered that the visual impact of the wind turbines is acceptable in this landscape, being in a Tier 1 Preferred Location for wind farms, as set out in *the Mayo County Development Plan*, 2022- 2028, and against the backdrop of existing turbines and the Ox Mountains.

The traffic generated by the hydrogen plant is considered to be strategic traffic, that is, traffic that contributes to socio-economic development and the volume of traffic generated, within the context of an improved access to the N59, is therefore in accordance with the purpose of the national road network and would not seriously diminish the carrying capacity of the national road network.

Positive environmental impacts would be the reduction in greenhouse gases and the decarbonisation of Heavy Goods Vehicles, including Public Service Vehicles in Ireland (estimated to generate circa 50,000 tonnes of carbon dioxide). Over 40 years, the wind farm and hydrogen plant would lead to the displacement of between 1.6 million and 2.5 million tonnes of carbon dioxide from the atmosphere.

There will be a permanent loss of circa 18.5 hectares, due to the construction footprint at the windfarm. This will be a limited offset by area the Biodiversity Enhancement Management Plan, which is 10.6 hectares in size.

During Decommissioning:

The Board considered;

- Risk of pollution of surface waters,
- Construction traffic movements.

These would be mitigated by the implementation of measures set out in the EIAR, which include specific provisions for decommissioning.

Appropriate Assessment

The Board agreed with and adopted the screening assessment and conclusion, as carried out in the Inspector's and Ecologist's report that the Ox Mountains Special Area of Conservation (Site Code: 002006); Killala Bay / Moy Estuary Special Area of Conservation (Site Code: 000458); Killala Bay / Moy Estuary Special Protection Area (Site Code: 004036) and River Moy Special Area of Conservation (Site Code: 002298) are the only European Sites in respect of which the proposed development has the potential to have a significant effect.

The Board considered the Natura Impact Statement and associated documentation submitted with the application for approval, the mitigation measures contained therein, the submissions and observations on file and the Inspectors and Ecologists assessments. The Board completed an appropriate assessment of the implications of the proposed development for the affected European Sites, in view of the sites' conservation objectives. The Board considered that the information before it was adequate to allow the carrying out of an appropriate assessment. In completing the appropriate assessment, the Board considered, in particular, the following:

(i) The likely direct and indirect impacts arising from the proposed development, both individually or in combination with other plans or projects,
(ii) The mitigation measures which are included as part of the current proposal, and
(iii) The conservation objectives for the European sites.

In completing the appropriate assessment, the Board accepted and adopted the appropriate assessment carried out in the Inspector and Ecologist report in respect of the potential effects of the proposed development on the integrity of the aforementioned European Sites, having regard to the sites' conservation objectives.

In overall conclusion, the Board was satisfied that the proposed development, by itself or in combination with other plans or projects, would not adversely affect the integrity of the European Sites, in view of the sites' conservation objectives.

Proper Planning and Sustainable Development / Likely Effects on the Environment

It is considered that, subject to compliance with the conditions set out below, the proposed development, would accord with European, national, regional and local planning and related policy. Following mitigation measures, the effects on the environment or the community in the vicinity, would come within acceptable standards, would not be likely to give rise to a risk of pollution or unsustainable demand for groundwater, would not be likely to give rise to a major accidents, would not be detrimental to the visual or landscape amenities of the area, would no adversely impact on the cultural and archaeological heritage of the area and would be acceptable

in terms of pedestrian, cycling and traffic safety. The proposed development, would therefore, be in accordance with the proper planning and sustainable development of the area.

23.0 **Conditions**

1. The proposed development shall be constructed, operated and where relevant, decommissioned in accordance with the plans and particulars lodged with the application, and as received by Board on the 06.07.2023, and as amended by submissions received 27.11.2023, 07.03.2024, 26.07.2024 or as may otherwise be required in order to comply with the following conditions. Where such conditions require details to be agreed in writing with the planning authorities and the development shall completed in accordance with the agreed particulars.

   Reason: In the interest of clarity and to ensure the protect of the environment and European sites.

2. The planning permission shall be for 6 years. The operation life of the planning permission for the wind farm shall be for 40 years, from the first commissioning of the wind farm. There is no time limit on life of the operation of the hydrogen plant.

   Reason: To ensure that the proposed development contributes to 2030 renewable energy targets and to provide clarity on the time frame for the operation of the wind farm and hydrogen plant.

   Construction

3. Prior to commencement of construction,

(a) the final turbine design and layout for the wind farm shall be submitted to Mayo County Council.and

(b) the equipment in the hydrogen chosen shall be submitted to Sligo County Council.

Reason: In the interest of clarity.

4. The mitigation and monitoring measures outlined in the plans and particulars relation to the construction and operation of the proposed development, including those set out in Appendix 17.1, shall be implemented in full or as maybe required in order to comply with the following conditions, save in relation to the operation of the hydrogen plant, where emission and water abstraction limits are the responsibility of the EPA. Details of a time schedule for implementation of mitigation measures and associated monitoring shall be submitted to the relevant planning authority.

   Reason: In the interest of protecting the environment, the protection of European Sites and in the interest of public health.

5. Details of the road network to be used by construction traffic including detailed arrangements for the protection of bridges to be traversed, shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. This should include Visual and Falling Deflectometer surveys prior to and on completion of construction. Pavement damage or deterioration identified shall be repaired by the developer, in consultation with Mayo and Sligo County Council.

   Reason: In the interest of traffic safety.

6. Prior to commencement of works, a property condition survey shall be carried out, if agreed with the property owner, along the construction haul routes east

of the N59 to the wind farm, hydrogen plant, on the grid connection and interconnector routes.

Reason: To provide a baseline of physical structures prior to commencement of construction, in the interest of amenity.

7. Method statements for water crossings, culvert designs and horizontal direction drilling shall be submitted to the planning authority, following liaison with the Inland Fisheries Ireland, prior to commencement of development. The method statements shall be informed by the *Guidelines on Protection of Fisheries during Construction Works in and adjacent to Waters*, 2016, by the IFI.

   Reason: To protect water quality and aquatic biodiversity.

8. (a) The final turbine delivery haul route and a report on the structural capacity of structures on the National Routes being utilised shall be submitted shall be submitted to TII.

   (b) Where works are identified, a Road Safety Audit shall be undertaken and form part of the above report.

   Reason: To ensure that the structures on the National Routes have the structural capacity to take abnormal loads, in the interest of traffic safety.

9. (a) An emission limit value of 25mg/l suspended solids shall apply to all discharges from the site to watercourses. The monitoring locations shall be agreed in advance with Mayo County Council and monitoring equipment shall be operational 3 months in advance of any works on site.

   (b) Dust levels at the site boundary shall not exceed 350 milligrams per square metre per day averaged over a continuous period of 30 days (Bergerhoff Gauge). Details of a monitoring programme for dust shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. Details to be submitted shall include monitoring locations,

commencement date and the frequency of monitoring results, and details of all dust suppression measures.

(c) Noise abatement measures shall comply with the recommendations for BS 5228, 'Code of Practice for Noise and Vibration Control on Construction and Open Sites'. The noise sensitive locations shall be taken to be the nearest residential buildings unless otherwise agreed in writing with the planning authority. Noise limits during construction will not exceed 55dBA LAeq 90 at the nearest noise sensitive location.

(d) A suitably qualified person will liaise with Mayo County Council in relation to environmental monitoring during the construction process.

(e) An Environmental Monitoring Committee (EMC) shall be established to assess and monitor construction works. The EMC shall consist of two representatives from each of the developer, Mayo County Council, Sligo County Council, the Inland Fisheries Ireland and local community representatives.

Reason: To ensure effective monitoring of the construction phase, in the interest of protection of the environment.

10. Details of aeronautical requirements, including any necessary lighting on the tower crane and stacks, shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development and provide 30 days notification of same. Subsequently, the developer shall inform the planning authority, Department of Defence and the Irish Aviation Authority of the co-ordinates in WGS84 format of the as constructed positions of the turbines. Similar notice of erection of tower cranes shall be provided for decommissioning purposes.

Reason: In the interest of air traffic safety

11. The planning authority and Department of Housing, Local Governments and Heritage shall be provided with the final archaeological report on completion of archaeological works on site.

    Reason: In the interest of protecting archaeological heritage.

12. The improvements to the junction access from the L6612-1 and the N59, shall be carried out prior to the construction of the hydrogen plant.

    Reason: In the interest of traffic safety.

13. Details of the materials, colours and textures of all the external finishes to the proposed buildings, including details of any signage, shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development.

    Reason: In the interest of the visual amenities of the area.

14. All planting/landscaping required to comply with the landscaping scheme submitted to shall be maintained, any if any tree or plant dies or is otherwise lost within a period of five years, it shall be replaced by a plant of the same species, variety and size within the planting season following such loss.

    Reason: In the interest of visual amenity.

15. Construction operations shall be restricted to between 08:00 hours and 19:00 hours Monday to Friday and 08:00 hours to 14:00 hours on Saturdays, save for any necessary deviations required. These deviations shall be agreed in advance with the relevant planning authority.

    Reason: In the interest of residential amenity.

    Operation of the Wind Farm

16. An Operations Environmental Management Plan shall be submitted to the planning authority for written agreement, prior to the commissioning of the wind farm. This will include for a water quality monitoring programme, as agreed with Inland Fisheries Ireland. The water quality monitoring programme shall include for monthly monitoring for the first three years of operation and quarterly, thereafter.

Reason: To protect water quality.

17. (a) The curtailment measures for the wind farm in relation to bat activity shall be reviewed annually and provide for adaptive monitoring, reviewed by a competent expert for the first five years of the operation of the wind farm, and thereafter, every three years for the operational life of the wind farm, unless otherwise required arising from the adaptive monitoring programme. The results of the monitoring will be report the regional staff of the National Parks and Wildlife Service.

(b) The developer shall review usage by birds and bats of the wind farm site and document bird and bat casualties through an annual monitoring programme, which shall be submitted by the developer and agreed in writing with, the planning authority prior to commencement of development. This programme shall be developed in consultation with the National Parks and Wildlife Service and shall cover the entire period of the operation of the wind farm.

Reason: To ensure appropriate monitoring of the impact of the development on the birds and bats of the area.

18. The relative rated noise levels (LA rated 10 min.) resulting from wind energy development and taking into account the cumulative impact of noise levels resulting from other existing and approved developments, shall not result in

noise levels, when measured externally at nearby noise sensitive locations not involved in the project, which exceed:

i. Background noise levels by more than 5 dB(A) $L_{90\ 10min}$,or 45 dB(A),$L_{90\ 10\ min}$ at standardised 10m height above ground level at windspeeds of 7m/sec or greater, between the hours of 07:00 to 23:00 and

ii. 43 dB(A) $L_{90\ 10min}$ at standardised 10 m height above ground level wind speeds, all other times.

Prior to commencement of development, the developer shall submit and agree in writing with Mayo County Council a noise compliance monitoring programme for the subject development., including the any mitigation measures such as the de-rating of particular turbines. All noise measurements shall be carried out in accordance with ISO Recommendation R 1996 “Assessment of Noise with Respect to Community Response,” as amended by ISO Recommendations R 1996-1. The results of the initial noise compliance monitoring shall be submitted to, and agreed in writing with, the planning authority within six months of commissioning of the wind farm.

Reason: In the interest of residential amenity.

19. There will be no shadow flicker at any existing nearby dwelling or other relevant existing affected sensitive property and the necessary measures outlined in the EIAR submitted with the application, such as turbine shut down during the associated time periods, should be taken by the wind energy developer or operator to eliminate the shadow flicker.

Reason: In the interest of residential amenity.

20. In the event that the windfarm causes interference with telecommunications signals, effective measures shall be introduced to minimise interference with telecommunications signals in the area. Details of these measures, which shall

be at the developer's expense, shall be submitted to, and agreed in writing with the planning authority within 6 months of the date of this Order, following consultations with the relevant authorities.

Reason: In the interest of protecting telecommunications signals and of residential amenity.

21. Details of aeronautical requirements shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. Subsequently the developer shall inform the planning authority and the Irish Aviation Authority of the co-ordinates of the 'as constructed' positions of the turbines and the highest point of the turbines (to the top of the blade spin).

Reason: In the interest of air traffic safety

Decommissioning of the wind farm

22. On full or partial decommissioning of the wind farm, or if the wind farm ceases operation for a period of more than one year, the wind monitoring masts, the turbines concerned and all decommissioned structures shall be removed, and foundations covered with soil to facilitate re-vegetation, all to be complete to the written satisfaction of the planning authority within 24 months of decommissioning or cessation of operation.

Reason: To ensure satisfactory reinstatement of the site upon full or partial cessation of the project.

23. An updated decommissioning plan shall be submitted to the planning authority, for its written agreement, 12 months before the decommissioning of the wind

farm, unless a further permission has been obtained for the continuation of the wind farm.

Reason: To enable the plan to be reviewed, having regard to relevant conditions pertaining to the time, in the interest of protecting the environment.

24. Prior to commencement of decommissioning works, a transport management plan for the shall be submitted to, and agreed in writing with, the planning authority. The traffic management plan shall incorporate details of the road network to be used, including over-sized loads, and detailed arrangements for the protection of bridges, culverts, or other structures to be traversed, as may be required. The plan should also contain details of how the developer intends to engage with and notify the local community in advance of the removal of oversized loads. All works to the public road network shall be at the developer's expense.

Reason: In the interest of traffic safety

25. The developer shall retain the services of a suitably qualified and experienced Civil Engineer and Ecologist for the duration of the decommissioning works in order to prevent damage to the integrity or stability of the peatland environment.

Reason: In the interest of protecting the environment.

Operation of the hydrogen plant

26. The hours of operation for the hydrogen plant shall 24 hours a day. HGV movements shall be limited to the hours of 07:00 to 19:00.

Reason: In the interest of residential amenity.

27. The number of tube trailer movements shall be limited to 52 movements per day.

Reason: In the interest of residential amenity.

28. Lighting shall be provided in accordance with a scheme, which shall include lighting along pedestrian routes. Details in this regard shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. The scheme shall minimise light pollution and shall minimise external lighting outside of operational hours.

Reason: In the interest of amenity and public safety.

29. (a)The primary source of raw water for the hydrogen plant shall be from rainwater harvesting.

(b) The abstraction of groundwater shall be limited to a maximum of 178 m^3 per day. In the event that a licence for abstraction of groundwater is required by the EPA, this part of the condition shall cease to have effect.

(c) Water levels in the Dooyeaghny Stream and South Corbally Stream shall be monitored on a continuous basis. In the event that water flows fall below the dry water flow rate (the annual minimum daily flow rate with a return period of 50 years) on the South Corbally Stream, groundwater pumping shall cease until water levels have recovered in the two streams. In the event that a licence for abstraction of groundwater is required by the EPA, this part of the condition shall cease to have effect.

Reason: In the interest of groundwater and surface water protection.

30. The applicant shall comply with the requirements of Uisce Eireann in relation to the public water supply.

Reason: In the interest of public health.

31. All chemicals, including fuels, cleaning and anti-scaling products, shall be stored in a bunded area of 110% capacity.

Reason: In the interest of environmental protection.

32. A plan containing details for the management of waste (and, in particular, recyclable materials) within the development, including the provision of facilities for the storage, separation and collection of the waste and, in particular, recyclable materials and for the ongoing operation of these facilities shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. Thereafter, the waste shall be managed in accordance with the agreed plan.

Reason: In the interest of environmental protection.

Financial Conditions

33. Prior to commencement of works, the developer shall lodge with the planning authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the planning authority, to secure the reinstatement of public roads which may be damaged by the transport of materials to the site, coupled with an agreement empowering the planning authority to apply such security or part thereof to the satisfactory reinstatement of the public road. The form and amount of the security shall be as agreed between the planning authority and the developer or, in default of agreement, shall be referred to An Bord Pleanála for determination.

Reason: In the interest of traffic safety and the proper planning and sustainable development of the area.

34. The Community Benefit scheme shall be adhered to for the life of the wind farm. The scheme shall be administered in accordance with the *RESS Community*

Benefit Fund Good Practice Principles, 2021, prepared by the Department of the Environment, Climate and Communications.

Reason: To ensure that the community living in proximity to the wind farm, benefits from it.

35. The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of Mayo County Council, that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000, as amended. The contribution shall be paid prior to commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to An Bord Pleanála to determine the proper application of the terms of the Scheme.

Reason: It is a requirement of the Planning and Development Act 2000, as amended, that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the permission.

36. The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of Sligo County Council, that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000, as amended. The contribution shall be paid prior to commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or,

in default of such agreement, the matter shall be referred to An Bord Pleanála to determine the proper application of the terms of the Scheme.

Reason: It is a requirement of the Planning and Development Act 2000, as amended, that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the permission.

I confirm that this report represents my professional planning assessment, judgement and opinion on the matter assigned to me and that no person has influenced or sought to influence, directly or indirectly, the exercise of my professional judgement in an improper or inappropriate way.

Mary Mac Mahon
Senior Planning Inspector

28th August 2024

24.0 **Appendix 1: Board Ecologist Report**

An Bord Pleanála

Report to Inspector

(Appendix to main report)

ABP-317560-23

Development	Proposed windfarm development including 13 no. wind turbines in Bunnyconnellan, Co. Mayo and hydrogen plant in Castleconnor, Co. Sligo. Carrowleagh, Bunnyconnellan, Co. Mayo & Curraun, Castleconnor, Co. Sligo
Type of Application	Strategic Infrastructure Development
Topic: **Appropriate Assessment** **EIA: Biodiversity and Ornithology**	Adequateness of information for purpose of Appropriate Assessment and Environmental Impact Assessment: Biodiversity
Ecologist	Maeve Flynn BSc. PhD. MCIEEM
Senior Planning Inspector	Mary MacMahon

Contents

25.0 **Introduction**

25.1. Scope of Report

25.1.1. This report to the Inspector and available to the Board is a written record of my review and examination of the submitted information for the Strategic Infrastructure Development (SID) planning application for Firlough Wind Farm and Hydrogen Plan Project regarding issues raised related to biodiversity and the requirements for Appropriate Assessment (including screening). In my capacity of Inspectorate Ecologist, I have the relevant expertise to provide a professional opinion as to the adequacy of the information for the Inspector and the Board to undertake Appropriate Assessment (AA) and Environmental Impact Assessment (EIA) of the proposed project.

25.1.2. In the review of the biodiversity aspects of the Environmental Impact Assessment Report (EIAR), I focus my examination on key issues raised in submissions including impacts on bats, peatland habitats, birds and impacts on aquatic habitats and species.

25.1.3. In my review of the Natura Impact Statement, I focus the examination on key issues raised in submissions and the requirements for screening for Appropriate Assessment and for Appropriate Assessment in view of the conservation objectives of relevant European Sites.

25.1.4. I have reviewed the scope of the proposed development as described in the EIAR and NIS and all aspects of the proposed development which consists of the construction of a 13-turbine wind farm, onsite 110kV substation, grid connections and ancillary works including turbine delivery route, the construction of a hydrogen plant (81MW alkaline electrolyser) and associated infrastructure including a substation and ancillary works.

25.1.5. I undertook a site visit to the proposed windfarm development site and Hydrogen plant site with the Senior Planning Inspector on 7th and 8th February 2024.

25.1.6. I have reviewed and examined the following documents including relevant appendices and figures (plans and particulars):

- Natura Impact Statement including AA Screening Report

- EIAR with particular focus on Chapters 5 Terrestrial Ecology, 6 Aquatic Ecology, 7 Ornithology and associated appendices
- Other relevant EIAR chapters 8 Soils and Geology, 9 Hydrology and Hydrogeology, 17 Interactions,
- Applicants response documents to submissions (x3)
- Issues raised at the Oral hearing related to biodiversity.

25.1.7. The documents have been reviewed with respect to the following current best practice guidance:

- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.
- CIEEM (2019) Ecological Impact Assessment Checklist (as relevant to Irish legislation
- EPA (2022) Guidelines on the information to be contained in environmental impact assessment reports.
- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC
- EC (2021) Assessment of plans and projects in relation to Natura 2000 sites. Methodological guidance on Article 6(3) and 6(4) of the Habitats Directive 92/43/EC
- EC (2020) Guidance document on wind energy development and EU nature legislation

25.2. **Submissions and observations**

25.2.1. I have had regard to submissions and observations related to biodiversity and AA matters and summarise key issues raised below. I have also considered the response documents prepared by the Applicant addressing third party submissions and observations (Nov 2023 and March 2024).

Statutory submissions

25.2.2. Department of Housing, Local Government and Heritage:

Observations submitted via the Development Applications Unit (DAU) relate to impacts on peatland habitats at the windfarm site and clarifications regarding the continued peat cutting at the site.

25.2.3. Inland Fisheries Ireland (IFI)

IFI stress the importance of local tributaries and rivers that are part of the River Moy SAC catchment and Easky River and the consideration of impacts generated for fisheries habitat.

- Important fisheries waters include the Brusna river, Owencam River, Srafaungal River and Dooyeaghny River.
- The River Brusna, part of River Moy SAC is important for Salmon, sea trout and brown trout spawning and nursery habitat.
- IFI state that the catchment is under pressure with Salmon numbers below conservation limit. Rivers Glenree and Srafaungal are failing to meet objectives of high ecological status and good ecological status under the Water Framework Directive and development must not prevent or delay achievement of these objectives.
- Dooyeaghny River has important spawning and nursery habitat (salmon and trout). IFI investing in enhancement of River Moy system and imperative water quality and water flows are protected to support this program.
- The Gowlan river, part of the Easky River is important for salmon and trout spawning and nursery habitat also. Freshwater pearl mussel is also a consideration and good ecological status must be protected.
- A series of 29 recommendations are listed and includes the establishment of an environmental monitoring committee which includes IFI and Mayo County Council.

25.2.4. Sligo and Mayo County Council made detailed observations on the proposed development which included biodiversity considerations and recommended conditions to be attached if planning permission granted for the proposed development.

Public submissions

25.2.5. General concerns regarding impacts on biodiversity were raised including:

- Impact on Bats (cumulative from windfarm and at survey at hydrogen plant area),
- survey effort for birds, vantage points surveys effort- impacts on golden plover,
- Impacts on *Vertigo angustior* (narrow mouthed snail) a qualifying interest species of the River Moy Estuary SAC
- Impacts on otter, freshwater pearl mussel (Easkey catchment), wetlands and peatlands,
- General concerns regarding the Habitats Directive and European Sites,
- Dooyeaghny River and potential impacts on aquatic ecology and fisheries, River Brusna and River Moy SAC,

25.2.6. **Oral hearing**

25.2.6.1. At the Oral hearing, Ecologist Ms Aine McCann acted as representative for several individuals. Areas of concern raised included issues raised in original submissions and the following:

- Impacts to bats at the windfarm site from direct collision and barotrauma, cumulative impacts with other windfarms, level of bat survey at hydrogen plant area, habitat fragmentation
- Importance of River Moy for fisheries, impacts to freshwater habitats and aquatic species including Freshwater Pearl Mussel (Easkey River), level of water sampling undertaken.

Following circulation of documents post oral hearing, Ms McCann submitted further observations on same issues.

25.3. **Expertise and technical content of Ecological Reports**

25.3.1. The biodiversity chapters of the EIAR, the NIS and associated reports provide statement of authority and detail the personnel involved, their qualifications, experience and specific role in the various ecological assessments. Dr Brian Madden (BioSphere Environmental Services) prepared the NIS and EIAR Chapters 5 and 7 with support from other specialist ecologist and Paul Murphy (EirEco Environmental Consultants) prepared EIAR Chapter 6 (Aquatic Ecology). I am satisfied that all ecologists and surveyors have the necessary (demonstrated) competencies and experience to carry out the work undertaken.

25.3.2. I am satisfied that the scope, structure and content of the EIAR and the NIS has been prepared in accordance with good practice guidance as cited in the relevant documents.

25.3.3. Based on the documentation provided, I am satisfied that the scientific information on surveys, nature conservation sites, species, habitats and their ecological significance, is adequate and up to date (at the time of submission and through discussion at the oral hearing) and included desk study, habitat and flora survey, breeding bird and non-breeding bird survey on lands within the application site, terrestrial mammal surveys including detailed bat surveys and aquatic surveys.

25.3.4. A number of submissions raised issues in relation to survey effort for bats, birds and aquatic sampling. Further clarification on was provided by the applicant in response documents and at the oral hearing. I consider these issues further in this report where relevant however, overall, I am satisfied that the ecological surveys were undertaken in line with published good practice methods and at the optimum seasonal periods providing a robust baseline for the impact appraisal as part of the EIAR and the NIS.

26.0 Consideration of the Likely Significant Effects on a European Site

26.1. Article 6(3) of the Habitats Directive

The requirements of Article 6(3) as related to Appropriate Assessment of a project under part XAB of the Planning and Development Act 2000 (as amended) are considered in this section. This section does not comprise the AA but serves to assist the Inspector and the Board in their assessment.

26.2. Screening for Appropriate Assessment

26.2.1. The first test of Article 6(3) is to establish if the proposed development is directly connected with or necessary to the management of a European sites and where this is not the case, then whether the development (either alone or in combination with other plans and projects) could result in significant effects to a European site in view of the sites conservation objectives.

26.2.2. The project is not directly connected with, or necessary for the management of any European Site and consequently is subject to the Appropriate Assessment Screening process. No part of the proposed development is within a European site. The windfarm site is located in close proximity to the western boundary of the Ox Mountains SAC.

26.2.3. The AA screening report prepared by the ecological consultants on behalf of the applicant considers a further 5 European sites due to proximity and/or the existence of possible ecological connections between various aspects of the proposed development and sites designated as SAC or SPA. All aspects of proposed project are considered including the windfarm site, hydrogen plant site, interconnector and grid connection routes and the turbine delivery route (TDR). Scientific information was collated from desk study, field survey and information from the National Parks and Wildlife Service resources (www.npws.ie).

26.2.4. Using the source-pathway -receptor mode, the report concludes that in the absence of mitigation, likely significant effects arising from the construction and operational phases of the proposed development (alone) cannot be excluded for the following European Sites in view of their conservation objectives (See Table 2 NIS):

- Ox Mountains Bogs SAC (code 000365) (Windfarm only)
- River Moy SAC (code 002315) (Windfarm, interconnectors and grid route, TDR)
- Killala Bay/Moy Estuary SAC (code 000364) (All aspects of proposal)
- Killala Bay/Moy Estuary SPA (code 002041)
  (All aspects of proposal).

26.2.5. The likelihood of significant effects is excluded for two SAC sites, Lough Hoe Bog SAC (code 00633) and Lough Nabrickleagh Bog SAC (code 00634) as it is possible to demonstrate with objective information that no ecological or hydrological connections exist between the sites any aspect of the proposed development.

26.2.6. The main potential impact mechanism identified arising from the proposed development is surface water pollution generated during the construction and operational phase and to a lesser extent decommissioning phase including release of suspended solids/nutrients, cementitious materials and hydrocarbons into the drainage network and watercourses linked to European sites. Such impacts could affect qualifying interest habitats and species sensitive to changes in water quality and the ecological requirements supporting their conservation status undermining conservation objectives and resulting in likely significant effects.

26.2.7. Works at the windfarm site could generate risks that may affect the ecosystem functioning of the Ox Mountains Bogs SAC and this site is also brought forward for more detailed assessment in the NIS.

26.2.8. The applicant considers that in the absence of mitigation measure these impacts could lead to adverse effects which could undermine the attainment of the conservation objectives set for these European Sites.

26.3. Screening recommendation

26.3.1. Having regard to the information presented in the AA Screening Report, including the nature, size and location of the proposed development, the various infrastructure elements and likely effects during all stages of the lifespan of the proposal, the source pathway receptor model and sensitivities of the ecological receptors, I

consider that the applicant has correctly identified the potential for significant effects for four European sites and that Appropriate Assessment is required.

26.3.2. I am satisfied that other European Sites in a wider area were considered in the screening report but excluded on the basis of objective information, with sites lying outside of any likely zone of impact due to distance and a demonstrated lack of meaningful impact pathways. The applicant did not have to rely on any mitigation measures to come to this conclusion.

26.4. **Summary of the Natura Impact Statement**

26.4.1. The assessments undertaken in the NIS are focused on qualifying interest features at risk from deterioration of water quality that may arise from release of suspended solids/nutrients, cementitious materials and hydrocarbons into the drainage network and watercourses linked to European sites (NIS tables 4-7) during the construction phase of development in particular, and potential operational impacts arising from the Hydrogen plant and windfarm. The possibility of significant effects on other qualifying interest habitats and species is excluded based on known distribution of habitats and species i.e. outside of the likely impact range of the proposals.

26.4.2. Targets and attributes set for conservation objectives of relevant qualifying interests for Ox Mountains SAC, River Moy SAC, Killala Bay/Moy Estuary SAC and SPA potentially affected by water pollution are detailed and assessed against identified impact mechanisms.

26.4.3. Mitigation measures focused on the maintenance of water quality are detailed for the construction, operational and decommissioning phases in sections 3.4, 3.5 and 3.6 of the NIS and integrated into the CEMP. Measures proposed follow the mitigation hierarchy with mitigation by avoidance applied in the first instance with turbines and key infrastructure set back from watercourses at minimum distance of 65m. Mitigation measures designed to protect receiving water courses from sediments and pollutants through containment and on-site treatment are detailed with supervised management and monitoring. Mitigation measures designed to further reduce risks to local watercourses are detailed (also Chapter 9 Hydrogeology and Hydrology and CEMP) which include standard best practices for construction site management, seasonally constrained in-stream works, use of double layer silt fencing. Detailed

measures are prescribed for avoiding and minimising risks of peat/ soil movement from the windfarm site. An emergency response plan has been developed to deal with residual risks of soil stability.

26.4.4. Where watercourse crossings are required as part of the installation of electricity connections as part of the grid and interconnector they will be by Horizontal Directional Drilling (HDD) and an environmentally friendly drilling fluid (Clearbore or similar) will be employed (NIS 3.4.3 and Chapter 9 9.5.2.6).

26.4.5. Mitigation measures described for the operational phase include wastewater discharge management. At the hydrogen site, hydrogen process wastewater will be dealt with separately to welfare wastewater (septic tank and constructed wetland). The hydrogen wastewater process, which includes water treatment reject, non-chemical rinse/ drains and oil/water separator discharge, will be collected in a sump prior to discharge to a process constructed wetlands (PCW). The PCW is stated to achieve a minimum of 6 days retention time prior to discharge to the Dooyeaghny River.

26.4.6. Mitigation measures for a major hazard event are primarily focused on the Hydrogen Plant (Chapter 16) and standard measures for the storage and containment of chemicals are detailed.

26.4.7. The assessment of in-combination effects (NIS 3.7) is focused on other windfarm developments as other permitted projects are domestic or agricultural with no identified pathways to European sites. No Plans are considered in the in-combination assessment. Nine wind farms within 20km are considered. The assessment, which excludes adverse effects in combination with other projects relies on the effectiveness of mitigation measures set out in the NIS and the effectiveness of measures for other wind farm develops which prevent pathways of impact.

26.4.8. Following detailed assessment, the applicant determined that adverse effects on the site integrity of relevant European sites from the proposed development can be excluded due to the monitored pollution control measures that will be in place during construction, operation and any decommissioning phase.

26.5. Adequacy of scientific information to inform the Appropriate Assessment

26.5.1. Having reviewed the NIS I am satisfied that it in general it provides adequate information in respect of the baseline conditions, identifies and evaluates impacts and uses the best scientific information and knowledge to determine implications in view of the conservation objectives of the European sites.

26.5.2. As described in the NIS, and in other chapters of the EIAR including Chapter 9, each element of the proposed development has hydrological connections and is upstream of SAC and SPA sites reliant on maintenance of water quality to achieve conservation objectives. There is potential for the proposed development to result in adverse effects on site integrity. Therefore the key issues relate to pollution prevention and risk reduction.

26.5.3. At the windfarm site, the construction phase and the management of peat during groundworks are of particular significance due to the sensitivity of receiving watercourse and also and all works involving watercourse crossings as part of the grid connections.

26.5.4. The operational phase of the Hydrogen plant, a new industry type in the area generated observations and submissions related to implications for the sensitive aquatic ecology of the River Moy catchment and Killala Bay/Moy Estuary SAC in particular.

26.5.5. IFI raise concerns for Salmon in particular, a qualifying interest of the River Moy SAC which they report as being below the conservation limit and therefore is not achieving the conservation objectives to maintain favourable conservation conditions as set by the National Parks and Wildlife Service.

26.5.6. The Board will note that where a conservation objective is set to restore favourable conservation status, the AA must demonstrate that the proposal will not interfere with or delay the attainment of such measures and that the proposal will not add to the threats and pressures already being exerted on the SAC/SPA or ecological processes required to support the integrity of the site.

26.5.7. Submissions and observations related to the NIS were addressed by the applicant in response documents (1 and 2) and during the course of the oral hearing, clarifying the assessment undertaken and confirming approaches to be adopted. Overall, I am

satisfied that the applicant has provided adequate information on issues raised related to the AA and has committed to applying measures requested by IFI in protecting the fisheries value of tributaries of the River Moy and part of the River Moy SAC.

26.5.8. In this section I provide further review and examination of a number of issues raised in submissions for the Planning Inspector and the Board relevant to the AA. Issues related to particular qualifying interest features are considered for each European site in view of conservation objectives.

Ox Mountains SAC

26.5.9. The risk of adverse effects for three qualifying interest habitats is identified and assessed in the NIS. Indirect impacts on ecosystem function related to soil nutrients could be undermined if construction related pollutants enter the Gowlan stream, particularly in periods of flood and deposit on adjacent wet heath, blanket bog or Rhynchosporain vegetation.

26.5.10. I am satisfied that the mitigation measures proposed combined with monitoring will prevent ingress of pollutants and remove this risk. The conservation objective is to restore favourable conservation condition to both Wet Heath and Blanket Bog habitats in the SAC and this objective will not be delayed or undermined by the proposed development.

River Moy SAC

26.5.11. The risk of adverse effects on four qualifying interest species is identified and assessed in the NIS. Aquatic species at risk from water pollution that could affect the Glenree and Brusna River systems in particular, include Sea Lamprey, Brook Lamprey, Salmon and Otter. I am satisfied that based on the evidence presented, none of the seven qualifying habitats for the SAC are present along these rivers and are outside any zone of influence of the risks identified. Similarly, white-clawed crayfish is not a QI at risk in these rivers (due to acidic nature of peatland influenced waters- the species is associated with calcareous influence and pH over 7).

26.5.12. The conservation objectives are to maintain favourable conservation condition for all qualifying interests in the SAC. However, as reported by IFI in their submission, Salmon are failing to meet the conservation limit in the River Moy

system. The conservation limit is defined as the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship.

26.5.13. The focus of mitigation measures presented in the NIS is to prevent ingress of pollutants into receiving watercourses and the applicant has also committed to implementing all measures proposed by IFI to ensure that conservation measures for Salmon would not be undermined by any aspect of the proposed development. I am satisfied that mitigation measures proposed combined with monitoring will be effective in prevent ingress of pollutants for all aspects of the proposed development so as to remove this risk and that conservation objectives will not be undermined for the River Moy SAC.

Killala Bay/ Moy Estuary SAC and SPA

26.5.14. The risk of adverse effects on two qualifying interest habitats (Estuaries, Mudflats and sandflats not covered by seawater at low tide) one species (Sea Lamprey) is identified and assessed in the NIS for Killala Bay SAC. Impact pathways from all aspects of the proposed development are linked to this SAC as it is the receiving waterbody for the River Moy and its tributaries including the River Brusna and Glenree. The proposed site for the Hydrogen plant is hydrologically connected to the SAC by the Dooyeaghny river which enters the estuarine environment at Caslteconor and the potential for adverse effects via this pathway is considered in detail in the NIS, response documents and at the oral hearing.

26.5.15. I am satisfied that other qualifying habitats are outside the zone of influence of the risks identified (being above high tide mark) and that impacts to Harbour Seal can also be excluded in view of the conservation objectives set for these qualifying interests.

26.5.16. Concerns were raised in submissions regarding the exclusion of Narrow-mouthed Whorl snail *Vertigo angustior* from detailed assessment in the NIS. Potential impacts arising from the operation of the Hydrogen plant in particular were raised. Conservation objectives set for this species are confined to one discrete site within the SAC at Killanly which is not hydrologically connected to the Dooyeaghny River and therefore potential impacts via surface water connections can be excluded. Impacts on Whorl snail habitat via groundwater connections to the

Hydrogen site were also raised but not considered at risk by the applicant (response document 1). I also note that in Chapter 9, it is considered that groundwater flow paths at the Hydrogen plant site are short due to underlying (unproductive) bedrock aquifer, recharging and discharging in local zones. Mitigation measures and environmental controls designed to prevent impacts on groundwater and surface water further reduce the likelihood of any impact of significance. I am satisfied that the applicant has not overlooked impacts on this species and that the justification presented in the response document is adequate.

26.5.17. I am satisfied that mitigation measures proposed combined with monitoring will be effective in prevent ingress of pollutants for all aspects of the proposed development so as to remove this risk and that conservation objectives will not be undermined for the Killala Bay/Moy Estuary SAC.

26.5.18. Similarly, these measures will be effective in preventing adverse effects on the SPA where the *at risk* habitats are the estuarine habitats which provide rich foraging for the wintering birds listed as qualifying interests. The distribution of wetland birds in terms of their range, timing or intensity of use of areas of the SPA will not be adversely affected.

26.5.19. Overall, I am satisfied that the information presented in the NIS, together with scientific information detailed in the response documents and elaborated on during the oral hearing conforms to best available scientific information and is adequate to allow the Board to reach complete, precise and definitive findings as part of the Appropriate Assessment of the implications of the proposed development on the integrity of the Ox Mountains SAC, The River Moy SAC, Killala Bay/ Moy Estuary SAC and SPA in view of the conservation objectives of those sites.

26.5.20. I consider that mitigation measures proposed and implemented through the application and monitoring of the CEMP will be effective in preventing pollution reaching sensitive receptors thereby excluding possible adverse effects.

27.0 Likely effects on the Environment: Biodiversity

27.1. Biodiversity

27.1.1. Effects on biodiversity are considered in three chapters in the EIAR and associated appendices. Chapter 5 Terrestrial Ecology, Chapter 6 Aquatic Ecology and Chapter 7 Ornithology. Taken together these chapters describe and asses direct and indirect effects of the proposed development on biodiversity with particular attention to species and habitats protected under the Habitats and Birds Directive.

27.1.2. In my capacity as Inspectorate Ecologist, the Planning Inspector requested support in terms of evaluation of the impact assessment and consideration of issues raised in relation to the following:

- Impacts on peatland habitats at the windfarm site (DHLGH observations)
- Impacts on Bats
- Impacts on Freshwater Pearl mussel (Easkey River system)
- Impacts on Birds

27.1.3. In considering these issues I provide summary tables which set out the key findings of the relevant assessments and address key points of the submissions, the applicants approach and my evaluation of the adequacy of the response based on the evidence provided and professional opinion for the purpose of the EIA to be undertaken by the Board.

27.2. Terrestrial Ecology

27.2.1. EIAR Chapter 5 examines impacts on terrestrial ecology including habitats and terrestrial mammals including bats. Key issues raised of relevance to this chapter include impacts on peatland habitats and impacts on bats

27.2.2. Tables 1-4 below summarise key issues in relation to peatland habitat at the windfarm site and bats.

Table 1 Biodiversity: Peatland habitats- summary of impact assessment (Chapter 5)

Habitat	Ecological significance	Impact	Impact significance
Cutover blanket bog (PB4)	Extensive at Wind farm site Ongoing peat cutting Local importance (higher value)	Permanent loss Temporary loss (excavate, store, deposit) Disturbance/degradation (from construction activity, drainage, areas of exposed peat) High bog at T3- drying effect	15.23 ha Moderate adverse effect 8.93 ha Slight adverse effect- medium term reducing to neutral long term Moderate adverse effect- medium duration
Lowland blanket bog (PB3) Links to Annex I habitat	Remnant areas 72.5ha total County importance	Permanent loss (T3 and T9)	0.49 ha Moderate adverse effect
Mitigation Measures	Restricted access across bog habitat Protection of areas of high bog (T 3 and T9), use of bog mats Re-vegetation of bare surface peat Biodiversity enhancement and management plan (habitat offset with preservation and enhancement of 10.6ha of blanket bog partly cut away)		
Residual effects	Habitat loss > than habitat preservation and enhancement area		

Table 2 Biodiversity: Peatland habitats- consideration of key issues raised in DHLGH observations

Issues raised	**Response**	**Consideration**
Peat cutting within the application area of the windfarm development: Assessment of peat cutting	Applicant confirms that peat cutting will cease within the footprint of the infrastructure and in the habitat restoration area but the applicant cannot extinguish turbary rights within the wider windfarm site.	Applicant responds (Nov 2023) with references to assessment of peatland impacts covered in EIAR in particular Chapter 9 Chapter 9 Hydrology and Hydrogeology assesses the lowering of water levels, which could lead to increased rates of erosion. Mitigation measures on site are designed to attenuate water on site and promote diffuse discharge and recharge of runoff.
Peat cutting in terms of the biodiversity enhancement and management plan	No further peat cutting at the 10.6ha plot selected for management	Tubary rights are outside of scope of consideration in wider wind farm area
Evaluation		
The windfarm site is part of an already worked cut over bog with extensive existing drainage and access track network. As it is not a licensed commercial peat harvesting area and there is no enforceable habitat restoration plan that can be implemented once peat harvesting concludes and the windfarm operator has no powers of land management outside of the infrastructure areas. The 10.6ha area identified for habitat preservation and enhancement is the only area within the gift of the applicant to contribute to positive biodiversity actions. Accept Applicants conclusion that a residual moderate adverse effect on peatland habitat is likely.		

Table 3 Biodiversity: Bats summary of impact assessment at windfarm site (Chapter 5)

Bats species	**Ecological significance**	**Impact (median Ecobat analysis)**	**Impact significance (Turbines)**
Total of 8 species recorded from activity and static survey	All Annex IV species requiring strict protection. 'least concern' on Irish Red list (2019)	Collision mortality, barotrauma Loss or damage to commuting and foraging habitat	Moderate to high levels of bat activity recorded from static survey. T4 and T10 medium risk for all bats species All other turbines **high risk:** T 1 and T11 high risk for Sop. pip
Leislers Bat	Most commonly recorded at windfarm site	High	
Common pipistrelle	3rd most common	High	
Soprano pipistrelle	2nd most common	High	
Natusius's pipistrelle	(low numbers - distribution has been considered concentrated in North East Ireland)	Medium to low	
Mitigation Measures	Buffer zone to forestry (calculated from standard formula) exceed for all turbines (minimum of 140m from conifer forestry edge) Feathering of blades (prevents rotating when not generating power) and increased cut in speeds- curtailment (shown in scientific literature to reduce bat fatalities by 30-90%) Increase cut in speeds during bat activity season (April to end oct) on all turbines except T4 and T10 with monitoring to inform any further adjustments to curtailment over operational phase Post construction monitoring- bat activity and fatality monitoring Maintenance of buffer zones (vegetation management)		
Residual effects	Not significant (no long-term adverse impact on populations)		

Table 4 Biodiversity: Bats- consideration of key issues

Issues raised	**Response**	**Consideration**
Bat activity at in the vicinity of certain Turbines queried: T1-2, 10,11	The static bat detector surveys showed higher levels of bat passes (an indicator of bat activity) at certain Turbines and Ecobat analysis of the data showed high risk for a number of species at all turbines with the exception of T 4 and T 10 which showed medium risk.	Analysis is in-line with standard assessment models and using EcoBat analysis. The windfarm site is not unusual and bat activity is reflective of the habitat present- forestry edge in particular.

Cumulative impacts with other windfarms	Bat landscape association model suggests local area is of low bat importance except around forestry edge. 10 windfarms within 20km (total of 66 turbines) Applicant considers that the non-significant impacts predicted for Firlough windfarm would not combine with other mitigated schemes to increase cumulative impact to significant level for local bat populations.	Cumulative impact response could be more detailed and consider likely movements of bats in local landscape. However, bat activity is likely widespread but patchy in the wider landscape, governed by foraging opportunities and movements between roost sites.
Adequacy of survey undertaken for Bats at Hydrogen site and surrounds	Preliminary roost assessment (trees (60) and buildings and sheds) – no evidence of bats roost found but some potential (low) in buildings and bungalow.	Survey adequate and proportionate to proposed development. While assessed, the proposed demolition of outbuildings and currently occupied house do not form part of this planning application.
Evaluation		

T1-T6 are closest to forestry edge, along this area, all turbines with the exception of T4 are considered high risk for bat species in particular Leisler's bat and soprano pipistrelle. Highest numbers of passes recorded along T1 and T2 close to the conifer plantation.

However, all turbines are located at a distance that allows adequate buffer from most impactful range from turbines and no habitat management (tree clearance) is required to limit that impact area.

Guidance on the location of turbines relative to woodland habitat recommend at least a buffer of 50m from blade tip to tree to reduce impacts and to aid in determining levels of woodland clearance required between Turbines and woodland edges. A buffer of 85m from blade tip to forestry edge is achieved at all locations.

Common pipistrelle, Soprano pipistrelle and Leisler's bat are considered high collision risk species. Therefore, where higher numbers of passes have been recorded there is a commensurate increased risk in collision or barotrauma caused by coming into airspace of turbine blades.

It is not possible to quantify how many bats could be affected- and the EcoBat model takes account of the species dynamics and population levels, and the outcome is a risk index.

No roost sites were identified in the vicinity of the windfarm which also lowers risks of impacts on local bat populations.

Mitigation measures proposed are in line with current best practice; feathering and curtailment (Eurobat guidelines for consideration of bats in windfarm projects (2014) NatureScot 2021 and

EC 2019) are proven effective mitigation measures applied to reduce risks to an acceptable level -that being considered one where a population level impact is excluded.

27.3. Aquatic Ecology

27.3.1. EIAR Chapter 6 examines impacts on aquatic ecology including evaluation and assessment of impacts on watercourses within a zone of influence of the various aspects of the proposed development. In-depth water quality assessments are considered in Chapter 9 Hydrology and Hydrogeology. Key issues raised of relevance to this aquatic ecology include potential for adverse effects on protected aquatic species including Salon in the River Moy system and Freshwater pearl mussel present in lower reaches of the Gowlan River, part of the in the Easkey River catchment. As the significant issues related to aquatic ecology are considered in the NIS and referred to in earlier sections of this report, they are not repeated in this section.

27.3.2. Tables 5 and 6 below summarise key issues in relation to aquatic ecology.

Table 5 Aquatic Ecology: summary of impact assessment (Chapter 6)

Aquatic receptors	Ecological significance	Impact	Impact significance
Owencam River-tributary of the River Brusna (Moy catchment)	Limited fisheries or aquatic habitat value within windfarm site however lower reaches of national importance for salmonid and lamprey populations	Release of sediments arising from construction related site works: Water quality degradation Deterioration of salmonid spawning habitat and FWPM habitat Direct impacts on species Indirect impacts on otter and kingfisher through reduction in prey availability	Moderate to profound adverse effects of short to long term duration
Tributary of Glenree River-Tributary of River Brusna (Moy catchment)	As above		

		Alteration and loss of riparian habitat where culverts proposed	
Headwater tributary of Gowlan River – Easkey Catchment	Limited fisheries and aquatic habitat value at windfarm site but lower reaches of national significance due to FWPM records 3.5 downstream Annex II, critically endangered, International importance	Fine sediment impacts directly on FWPM and alters riverbed	Medium term significant adverse effects at National scale
Dooyeaghny (or Cloonloughan river)	Local -higher importance for fisheries and aquatic habitat value in vicinity of hydrogen site but lower reaches has salmonid spawning habitat	Construction: Drainage from site direct to vegetated swale to outfall in river- Sediments and pollution risks Operation: risks from chemicals used at site entering waste water system, treated water discharging into stream and changes to flow rates	Medium term significant adverse effect
Also, Horizontal direct drilling at Srafaungal River, Fiddaun Stream, Glenree Stream, Loughnagore Stream for 110kV Grid connection Four watercourse crossings including one HDD crossing of Brusna river for installation of interconnector (between windfarm and Hydrogen Plant site).			
Mitigation Measures (summary)	Mitigation by avoidance during design- locating turbines and infrastructure at set back distance, numbers of watercourse crossings. Detailed suite of measures to protect all receiving waters from potential impacts during all stages of the development (see also Chapter 2 and Chapter9) and integrated into detailed CEMP: Ecological Clerk of Works- ensure compliance Detailed surface water management plan, water quality monitoring plan and waste management plan Measures developed in line with cited best practice and guidance Sustainable drainage systems (SuDS)		

	Waste water treatment at Hydrogen Plant (EPA license) Process constructed wetland with 6 days retention time – discharge to Dooyeaghny River
Residual effects	Negligible impact

Table 6 Aquatic Ecology- consideration of key issues

Issues raised	**Response**	**Consideration**
Impacts to Freshwater pearl mussel (FWPM) – Gowlan River part of Easkey system,	Applicant confirmed survey approach. Nearest records of FWPM are 3.5 km downstream of red line boundary. Tributary of Gowlan river at windfarm site does not hold suitable habitat – potential impacts from construction and operation are detailed and considered to be potentially significant adverse in the absence of mitigation	The potential for adverse effects on the Annex I species is key consideration in assessment and in design of suitable mitigation. Applicant addressed concerns in response documents adequately. Mitigation measures are designed around preventing deterioration of water quality.
Inland Fisheries Ireland: Impacts to salmonid fishery habitat in River Moy catchment : references to all tributaries including: Glenree, Brusna, Srafaungal River, Fiddaun Stream, Gowlan river, Dooyeaghny Proposed development cannot undermine conservation initiatives being implemented in the catchment to enhance fisheries habitat	All recommendations accepted by applicant Additional monitoring to be applied for water flows (related to abstraction for Hydrogen Plant) for Dooyeaghney river	Applicant addressed concerns in response documents adequately. Mitigation measures are designed around preventing deterioration of water quality.
Evaluation		
The sensitivity of receiving watercourses is of primary concern in the assessments undertaken by the applicant and potential for significant adverse effects have not been underestimated. The suite of mitigation measures proposed including ongoing monitoring have been designed in line with best practice and guidance and will be effective in achieving their aims. The Applicant has fully engaged with the IFI submission and requests for clarification on mitigation measures and		

fully adopts all recommendations. I recommend that these be conditioned in their entirety to ensure that conservation measures being implemented in the River Moy are supported and not undermined in anyway by the proposed development.

I Concur with the Applicants overall conclusion of negligible residual impacts with full implementation and monitoring of mitigation measures.

27.4. **Ornithology**

27.4.1. EIAR Chapter 7 examines impacts on ornithology (birds). Key issues raised of relevance to this chapter include survey effort and methodology, records and impacts on Golden Plover.

27.4.2. Tables 7-8 below summarise key issues in relation to Ornithology.

Table 7 Ornithology: summary of impact assessment (Chapter 7)

Key species	**Ecological significance**	**Impact**	**Impact significance**
Kestrel Sparrowhawk Merlin Breeding birds of conservation importance): Snipe- two territories on bog site woodcock Red Grouse Wintering birds: Golden Plover (flying over)	Windfarm site of County importance for breeding birds (Red grouse and snipe and Merlin) Hydrogen site of limited importance for birds of conservation concern	Habitat loss Disturbance to breeding birds during construction Nest damage or destruction during breeding season for ground nesting birds Collision, Displacement Barrier effects	Loss of 15.72 ha of peatland habitat: moderate adverse effect- permeant effect Disturbance of breeding Red grouse, snipe and Merlin: Significant adverse effect- short term Modelled collision risk for Kestrel and Golden Plover range from imperceptible to not significant
Mitigation Measures And monitoring	Biodiversity enhancement management plan – preservation and enhancement of 10.6ha blanket bog Confirmatory pre-construction surveys will establish if 400m-500m buffer zones are required around any ground nesting bird sites: Red grouse, Merlin, Snipe at the windfarm site. Seasonal restrictions on the clearance of vegetation Monitoring:		

	Post construction flight activity surveys using Vantage point methods, monthly during years 1, 2, 3, 5, 10 Distribution and abundance survey and red grouse survey (under license) for years 1,2,3 and 5 Collision search
Residual effects	Imperceptible to Slight.

Table 8 Ornithology: consideration of key issues

Issues raised	**Response**	**Consideration**
Bird survey effort and methods	Multi annual surveys undertaken from 2019-2021 • Flight activity (Vantage Point) surveys • Breeding & winter bird transect surveys • Hinterland surveys • Breeding merlin surveys • Breeding woodcock surveys • Red grouse survey	All surveys analysis undertaken in line with current best practice Survey effort proportional to habitats present and bird species
Impacts on golden plover	Applicant clarified Golden plover movements recorded at the windfarm site during winter season. No evidence of the species breeding at the windfarm site- there are records of breeding in the Ox mountains and historical data (2005) of breeding east of the Carroleagh wind farm.	Applicant has considered the species to adequate level
Evaluation		
I consider that the Applicant has adequately addressed and considered issues related to ornithology based on knowledge of the site collected over multiple years of bird survey and based on best available scientific information. I consider that the information provided allows for a robust assessment and that the proposed development will not result in significant impacts on bird species.		

28.0 **Conclusion**

28.1. Appropriate Assessment

28.1.1. I consider that together with the scientific information presented in the NIS, response documents and clarifications provided during the course of the Oral Hearing the Board can be satisfied that there is adequate to ensure that all aspects of the project can be assessed by the Board and to provide for complete, precise, and definitive findings for the purpose of Appropriate Assessment.

28.2. **Biodiversity**

28.2.1. The information presented for the biodiversity impact assessment as part of the EIAR is proportionate to the ecological receptors identified and adequate for the purpose of identifying likely significant effects for the purpose of EIA.

28.2.2. Issues of concern raised in submissions have been addressed by the applicant throughout the EIA process including responding to submissions and observations and engaging in the oral hearing

28.2.3. I consider that the application and monitoring of mitigation measures will ensure that significant impacts on key ecological receptors will be avoided.

Signed:

Maeve Flynn BSc. PhD, MCIEEM
Inspectorate Ecologist

30th July 2024

29.0 **Appendix 2: Oral Hearing Proceedings**

29.1. ***Day One***

Applicant's opening statement

29.1.1. The applicant's design team outlined the project and provided responses to questions sent out by the Inspector with the oral hearing agenda. Mr. David Kiely of Jennings O' Donovan And Partners (JODA) explained how there was permission previously on the site and permission granted in the area for turbines of similar height to those proposed.

29.1.2. *Applicant's Response to Inspector's Questions as set out in the Oral Hearing Agenda*

1. EIAR Screening

29.1.3. The first question related to screening of the project for EIA purposes and whether the provision of the hydrogen plant on its own would have triggered EIA. The applicant was invited to consider whether the EIAR as submitted, could have been amended to consider the details of the preparedness for and proposed response to emergencies arising from such an event. This could have included information on the preparedness of the local authority services in dealing with an emergency, as per the consultations referred to in the EIAR.

29.1.4. Mr. Hugh O'Neill, SC, confirmed that the hydrogen plant could come under a mandatory EIAR under Class 6 (b) of Part 1 or Class 6 (a) or Class 6 (b) of Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 as amended. Class 6 (b) provides for integrated chemical installations for the production of basic inorganic chemicals. Class 6 (a) provides for installations for the treatment of intermediate products and production of chemicals using a chemical or biological product. Class 6 (d) in Part 2 is for storage facilities for petrochemical and chemical products, which are subject to the Seveso Directive. He noted that irrespective of the trigger for EIAR, one had been submitted and that the Board had to assess the application on that the basis of environmental impact assessment, referring to S171A of the Planning Development Act. A written response was submitted as '*Response to Inspector Question No. 1 'Review of EIAR Screening*'.

29.1.5. In response to a question from the Inspector on the preparedness of the local authority emergency services for a development of a hydrogen plant, Mr. Kiely stated that the hydrogen plant had been tested for Preliminary Hazard Analysis and Quantitative Risk

Assessment. The latter was prepared under the HSA's Technical Land Use Planning Guidelines and updated during the application process. It complies with the EIA Directive. Engagement has taken place with the HSA and Sligo Fire Service. Actions underway and planned for future phases, once permission is granted, is the further refinement of the Quantitative Risk Assessment, a Risk Management Programme, an ATEX Assessment (for employees), a Safety Management System and completion of the Major Accident Prevention Policy. Mr. Kiely referred to a map showing a number of COMAH sites in the vicinity of the proposed hydrogen plant and stated that such sites are '*not alien'* to the area.

29.1.6. I note that Ms. Aine McCann, an observer, later in the oral hearing expressed concern that this line of questioning was overstepping the mark, placing the board in the role of the HSA. However, the question (1)(b) is derived from 2(h) of Schedule 6 of the *Planning and Development Regulations*, 2001, as amended, which concerns information to be contained in an EIAR.

2. Health and Safety Issues

29.1.7. The Risktec QRA report (Issue 4: 11th January 2024) was to be updated to use a common basemap to enable comparison between figures. The QRA was updated for the oral hearing, Issue 5, 14th March, 2024. Issue 3 of the QRA (14th June, 2024) was submitted with the application. It was stated at the oral hearing that the safety contour lines have remained in the same location, notwithstanding the use of different base maps and the colours denoting the consultation distance, outer, middle and inner zone are now used consistently. I am satisfied that this is the case.

29.1.8. Mr. Lipston of Risktec Solutions Ltd expects that the project is further defined, the risk contour lines will contract, further away from the residential properties, which answers the Inspector's question on what could be done to reduce the area covered by the contours. He stated that the outer consultation distance zone (yellow) in the risk of fatality is 1 in 1 billion. Zone 3, the blue line is the outer boundary where the mortality risk is 1 in 10 million. Future housing could be allowed in these zones, but the extremely low levels of risk in these zones. Zone 2, the middle zone and green line, has a fatality risk of 1 in a million. Zone 1 spreads across the property line, but this zone is expected to be reduced in area, with greater certainty on safety standards of equipment being used. There is no existing building in this zone. The nearest building

is a milking parlour and this is more than 40 metres outside the 1 in 1 million risk contour. The current zones are all based on a worst case scenario. He noted that in most cases, if there is a hydrogen leak, it does not result in a fire but will simply dissipate in the air. The design process is based on As Low A Risk As Reasonably Practical. Mr. Lipston noted that the risk of fatality for an agricultural worker in Ireland is approximately 1 in 50,000.

29.1.9. Mr. Lipstone considered that in a worst-case scenario, flash fires and explosions, which are short lived events, were unlikely to spread off the site, to a forested area. These fires occur for a few seconds only and are very unlikely to spread elsewhere. Jet fires, which are long duration fires, are the only type of fire to spread and is least likely. He noted that there Upper and Lower Tier COMAH sites in Ballina, one of which is for Liquid Petroleum Gas for Flogas and the other for Ballina Beverages. These represents similar hazards to the current project, namely the use of flammable gases. The proposed development would not provide for new hazards that the fire service would not be already familiar with. At detailed design stage, further consultations will occur with the emergency services, as part of the COMAH Regulations, so that suitable emergency plans are put in place at that point.

29.1.10. The final part of the question on the appropriateness of the assumption of 90% indoor occupancy in a rural area, Mr. Lipston said that this was based on HSA guidance, which they adhered to. He noted that different percentage numbers could be used, but ultimately, this would not make a significant difference to the risk.

3. Traffic Safety

29.1.11. A design report for the proposed junction with the N59 was included in the applicant's response to submission, which was submitted prior to the opening of the oral hearing.

29.1.12. The applicant's team was asked to justify the increased traffic from an existing access, having regard to national and local roads policy to avoid intensification of traffic. Mr. Kiely of JODA said that traffic from the plant was very low, with 52 movements of HGVs over a 12 hour basis, which would translate to 1 movement per hour to 4/5 per hour at the maximum stage. Observers later pointed out that a residential dwelling would not be permitted onto the N59 and this would generate less traffic. The written response referred to the need for the hydrogen plant to be relatively

remote for sufficient setback distance, proximity to a wind farm to be connected by underground cable, and to be in close proximity to the national road network to transport the product. The impact of increased traffic on the N59 will be imperceptible.

29.1.13. The response refers to a number of wind farms that connect directly to the national roads network – Oweninny Wind Farm connects to the N59 in Mayo (ABP ref: 16.PA0029); Cloghan Wind Farm and Derrinlough Wind Farm to the N62 in Offaly (the latter an ABP decision PA19.306706) and the Inchamore Wind Farm to the N22 in Kerry (ABP-317889-23).

29.1.14. The applicant's team argue that no material intensification occurs due to the low level of operational traffic. In addition, the proposed development would improve traffic safety for all junction users.

4. Technical Issues

29.1.15. A revised drainage drawing was submitted, showing the discharge drain within the redline and consistent with the conceptual drainage system as set out in the EIAR. The detail of the constructed wetlands and cross sections of the underground tanks, hydrogen plant and constructed wetlands were provided.

29.1.16. Figure 1.3 was revised to correct the households in the vicinity of the proposed hydrogen plant and the noise maps (11.5 – 11.9) were also revised. It removed two unoccupied houses (HH10 and HH13) from the drawing.

6. Existing wind farm

29.1.17. Drawings showing the existing wind farm turbines, extension, turbines to the northeast and the proposed wind farm were submitted, with the levels of the turbine base provided.

7. Noise

29.1.18. In relation to Noise, the oral hearing agenda requested that the table in 11.14 appeared incorrect, as there was no change in the sound power at 5 m/sec; that the noise contour maps show the location of housing and their numbering and to indicate the noise currently being experienced by these houses from the existing wind farm.

29.1.19. In response, the EIAR chapter on Noise and Vibration was updated. The main change was to address the fact that the wind speeds at lower levels had been standardised to a higher level than would be experienced. The changes to the chapter

are highlighted in yellow. Indeed the noise levels in the revised chapter are lower at lower wind speeds than that submitted at application. The contour maps were amended to number the houses, but the contour lines are unchanged. The existing wind farm noise contour lines is provided.

8. Technical Issues

29.1.20. Mr. Stewart Conaty (Beauchamps Solicitors) referred to updated drawings. The blue line was extended to include the Biodiversity Enhancement Management Plan area, on Drawing 6129-ABP OH-005. It is accompanied by a letter from Beauchamps Solicitors, which includes the folio numbers, reference to a binding Option Agreement for a Grant of Easement over the area to implement and maintain the Biodiversity Enhancement Management Plant. In addition, the registered owner, (the name and address are provided) are not permitted to do anything that would interfere with the enhancement works. A list of landowners, property addresses, folio numbers and indication of their consent are provided.

29.1.21. The works to the public road, which mainly relate to the interconnector cable, as well as some road improvement works, will be carried out under statutory authority by a statutory undertaker. Therefore, consent is not required from landowners.

29.1.22. Having regard to the change in the blue line, I suggested that the change was material and would warrant re-advertising. Mr. O'Neill considered this unnecessary. Ms. Ní Dhuinneachair also stated that she did not consider that it would require re-advertising and sought that the board proceed to decide the case, which has been a source of considerable distress to the observers for two years. Nonetheless and mindful of the requirements of the EIA Directive on participation, I consider this necessary.

9. EIAR

29.1.23. The 'Worst Case Scenario' was tested by the Applicant's Team in the EIAR, as explained by Ms. Sarah Jones of JODA where a number of projects could be being constructed or operating at the same time, to test if the mitigation measures are sufficiently robust to deal with this scenario. The response noted that there are two single wind turbine projects and a grid connection that could be undertaken at the same time. A table is provided for each chapter, considering the mitigation measures

and residual effect. The findings are that the mitigation measures are adequate to cope with this scenario and the residual effects are not significant.

Sligo County Council

29.1.24. Mr. Ian Bailey outlined Sligo County Council's considerations. He stated that the council has reservations in relation to the basis of a hydrogen market. Another is the size of the hydrogen plant and its visual impact on the landscape. There is an absence of CGIs. He asked if there were ways to reduce the visual impact, by using a number of buildings, to reduce the scale.

29.1.25. He noted the council policy to protect the carrying capacity of the national road network. An intensification of the existing access will arise and this has not been addressed.

29.1.26. A bond will be required in the event of a grant of planning permission for the roads and road structures.

Grace Dempsey

29.1.27. Ms. Grace Dempsey is a wheelchair user with significant medical needs. She is particularly sensitive to loud noises and is concerned about construction trucks passing her home on the L1102. She needs lengthy sleep periods, to avoid seizures, including Saturday mornings. She is collected by bus and is concerned that construction traffic will delay her and others that rely on the bus.

Marcelle Dempsey

29.1.28. Ms Marcelle Dempsey is mother to Ms. Grace Dempsey and shares her concerns about construction traffic. If an ambulance was required, would this be delayed by construction traffic or due to traffic diversions en-route. She is concerned about fire safety.

Applicant's Response

29.1.29. The applicant made several commitments to the Dempseys, which were confirmed in writing to the Board during the hearing. The Dempsey home is located on the construction haul route for the wind farm. There will be increased traffic for circa 21 months, with an average of 15 trucks per day. The busiest time will be on 13 days (not consecutively), where the concrete pours for the construction will take place. On those days, there will be 140 trucks per day. Ms. Dempsey and the wider community

will be informed of these dates in advance. The Traffic Management Plan, will be agreed and updated with Mayo and Sligo County Councils. A dedicated telephone number will be provided to the Dempseys in the event of a medical emergency. Should this arise, all deliveries will be suspended to ensure priority access for any medical personnel.

Ailleen Ni Dhuinneachair / Bríd Nic Ghabhann

29.1.30. Ms. Ni Dhuinneachairr made a presentation on behalf of herself and Ms. Nic Ghabhann, tríd gaelige. Ms. Claire Rowland translated the submissions into English.

29.1.31. The use of two file numbers on the file made it difficult to find on the website. The use of Irish led to a delay between those receiving information from the Board in English and Irish. Given that a lot of this information was generic, it is hard to understand why there would be no standardised templates.

29.1.32. Her points of concern in relation to the application concern the impact of the proposed wind turbines on the two archaeological tomb sites. Having been at the tombs on the spring and summer solstices, she is noted that the rising sunlight fell on the entrances to the tombs and illuminated the interior. She is concerned that both T11 band T6 will interfere with this connection. She suggested that new path be provided to access the tomb sites that would be accessible for everyone. This should not be concrete, but in keeping with the landscape. She questioned the locations of the tombs on the maps, as they do not coincide with the Ordnance Survey maps.

29.1.33. She considers that the area has had a significant amount of wind farms permitted and constructed and that the proposed wind farm would lead to an overconcentration of this type of development in the Ox mountains.

29.1.34. The traffic survey was not considered appropriate for the area, as peak hour traffic starts later, as schools and shops open later in the morning than on the east coast. The wrong road number is used in the Road Safety Audit. The Road Safety Audit refers to Carrowleagh. There are many mistakes which throws the quality of the application into question.

29.1.35. *Applicant's Response*

29.1.36. Ms. Kate Robb of John Cronin and Associates responded in relation to archaeology. Ms. Robb completed her Master's Thesis on court tombs so was

particularly knowledgeable on the subject. She said that there were around 300 such tombs in the country, all facing east. However, no alignment with the solstices has been discovered to date.

29.1.37. Ms. Robb confirmed that the Ordnance Survey maps are incorrect.

29.1.38. In relation to Sligo County Council's submission, Mr. Ben Stephenson of Black & Veatch explained that the nature of the process did not lend itself to separate buildings; the machinery has to operate within one unit. Mr. Richard Barker of Macro Works stated that the building, while large in scale, can only be seen in glimpses. Screening is being provided to seclude the building further.

29.1.39. Mr. Cecil Shine from Minerex stated that the priority in relation to water supply for the process was to use rainwater as the primary source and groundwater as the secondary source. Tertiary, if required, from the mains supply. The Zone of Contribution to wells 6 and 7 doesn't extend east or west or across the stream and doesn't affect any wells. The wells were tested during the dry period. During the winter, the Zone of Contribution is more limited in area. There are no wells serving other properties within this Zone of Contribution, to their knowledge.

Aine McCann

29.1.40. Ms Aine McCann is an environmental scientist and stated that in the interest of transparency, she previously worked for John Curtin, the ecologist for the applicant dealing with bats.

29.1.41. Ms McCann said that there would always be wars and crises and that this is no reason to breach protocol for proper planning. An ecological problem cannot be solved while at the same time resulting in another ecological problem.

29.1.42. Ms McCann said she was unclear about the project, about whether it was to supply electricity or create hydrogen or both and what the timeframe for the upscaling of the project. This impacts on noise and traffic and the effects on the community.

29.1.43. Ms McCann was concerned about bats. She said that bats, which are legally protected, will be killed and injured. Who will undertake corpse searches? would be undertaken. The bat surveys showed that 9 out of the 10 bat species found in Ireland were on the site. Two species of particular concern are Liesler's Bat and Nathusius' pipistrelle. Ireland is the global stronghold for Liesler's Bats. She is concerned about

collision risk for these breeds, which is high, pre-mitigation. Turbines 1, 2, 10 and 11 would have the most impact. The wind farm site has a high level of bat use and the use relates to corridor and feeding area. Bats can fly 40-60 km, once they leave their roost. There is a concentration of turbines building up in the area, which will impact in terms of habitat fragmentation, forcing bats and birds to fly further. There will 55 turbines within 1.6 km.

Leona Mulrooney, Stephen Donegan and Leola Donegan observation

29.1.44. Ms. Leona Mulrooney made the observation. Her family live in HH5, which she states is currently closest to the entrance (80-100 metres). The house is newly built and she is particularly concerned about the value of the house and whether it would experience depreciation as a result of its proximity to the hydrogen plant. She was concerned about the ability to get house insurance.

29.1.45. Light pollution, including the lights from passing trucks, would impact on her amenity. The lands are unzoned and an industrial use is not suitable. The area is prone to gorse fires. Sligo Hospital is 55 km from the site. The people of Enniscrone have not been considered.

29.1.46. Road closures will severely impact on people's lives.The concerns about driving on local roads during the construction period, the difficulty of buses and other vehicles using very narrow roads and devaluation was echoed in the observations of *Susan Donegan, Danny and Sandra Beardshall*. The issue of an industrial island was also referred to *Patrick Donegan Snr*.

Leo Mulrooney

29.1.47. Mr. Leo Mulrooney was represented by Ms. McCann. He is particularly concerned about the impact of the proposed development on aquatic life; the Freshwater Pearl Mussel and the Dooyeaghny Stream. Salmon and sea trout are very important to the tourist industry. The Freshwater Pearl Mussel, located in the Easkey River, is protected under the Wildlife Act and the Habitats Directive and is critical endangered. The species is very vulnerable to sedimentation in the streams. Works could also release phosphorus. The Inland Fisheries Institute's letter highlights the critical importance of the area. The works to bridges could impact on salmon. Algae could flourish, impacting on larvae. The Dooyeaghny Stream's downstream flows into the Moy Estuary and Killala Bay, so there is a direct connection. It has only been tested

once and should be tested again. Phosphorous and potassium hydroxide could lead to fish kills and affect aquatic vegetation, due to shock rises in pH levels. Ethylene Glycol is very dangerous for the environment, if it escapes from the closed loop system. It could reach the aquifer.

29.1.48. The volume of hydrogen stored has been underestimated as 7 tonnes could be stored in the storage tank. A figure of 40 tonnes is used by the applicant. People are more likely to be outdoors in rural areas.

29.1.49. The safety of equipment, impact of noise or low vibrational noise cannot be determined because the specific equipment has not been identified. Like a vacuum cleaner; the noise from each brand is different. The noise insulation for the building cannot be determined, because the level of noise is unknown. Low vibration noise will keep people awake at night.

29.1.50. Fire fighters will have to be retrained as hydrogen gas has more than 2.2 times the explosive power of TNT.

29.1.51. It is unclear that the water which may be required from the mains is available. It is equivalent to 10 dairy farms per day. De-chlorination would be required, which would add to costs.

29.1.52. *Susan Donegan*

29.1.53. Ms McCann represented Susan Donegan. Ms. Donegan is concerns about traffic, traffic safety and impact on her personal health, amongst other issues. The stress of the proposed development has impacted her and her family relations. She gave permission to have these discussed. Meeting construction trucks and tube trailers on the road is very concerning. There have been 40-45 accidents on the N59 per annum. There is a blind dip on the road. There will be a chronic negative effect on the volume of traffic using the road. The value of her home has fallen, so she cannot downsize. Devaluation occurred where a biogas plant was planned for Gort, in Co. Galway and is confirmed by Mr. Billy Hefferon, an auctioneer. Trucks will not stick to the Sligo route and will take the shortest route or cheapest route. More investigation of bats is required.

29.1.54. *Patrick Donegan Snr*

29.1.55. Mr. Patrick Donegan, represented by Aileen Ní Dhuinneachair, who owns land adjacent to the N59, which has been in his family for generations. Ms Ní Dhuinneachair outlined how previously there were plans to widen the N59. The applicant had sought to buy land but this was rejected. The applicant has no right to trim Mr. Donegan's hedgerows, as stated on Drawing 6129-PL-121. He questioned why the house is not part of the applicant.

29.1.56. *Danny and Sandra Beardshall*

29.1.57. Additional points made by the Beardshalls (HH18) as well as devaluation and changes to lifestyle, was the absence of time for observers to study the documents submitted prior to the oral hearing. Notification was only received one day in advance of the hearing. The applicant had submitted two rounds of responses and the first round was removed from the website when the second one was uploaded. [Inspector – the website was corrected following this information].

29.1.58. The ability of the applicant to operate the plant is questioned. Subsidence of the family home is also a concern, due changes in groundwater. Mr. Beardshall notes that while assurances are given that there will be no impacts, who would pay for damage to property? The Fire Service would not need training in relation to hydrogen, if there is no plant permitted. The local area will not benefit from the community benefit fund, as it will be spread over two counties. The proposed development is premature in Ireland. It could be sold off in the future.

29.1.59. Mrs. Beardshall made similar points in relation to devaluation. They did not buy into an industrial area and their home is for their retirement and future inheritance for their family. Children under 9 years of age will live near an industrial plant.

29.1.60. *Bartholomew and Jackie Morrisroe*

29.1.61. Mr. Michael Reddington represented the Morrissroes, who also later made personal submissions. Mr. Reddington referred to the *National Hydrogen Strategy* and that Ireland (and the applicant) has not experience in hydrogen to date. There are gaps in the industry and the supply chain on an EU wide basis. He suggested that hydrogen plants should be clustered and located near industry, so economies of scale could be achieved. Hydrogen will be used as a substitute for natural gas, but that does not apply to the proposal, as there is no natural gas infrastructure. Another major opportunity is the export of hydrogen, created by offshore wind farms. Hydrogen will

also be used by large power stations for dispatchable electricity, such as Moneypoint. The proposed project does not fit this criteria. Future hydrogen refuelling stations on the Ten T motor routes through Europe will require hydrogen at 700 bar, supplied by regional or local electrolysers. The Ten T routes in Ireland are Foynes to Dublin, Cork to Dublin and Dublin to Belfast routes. These are not proximate to the proposed development. The market for hydrogen to date has been limited and Dublin Bus does not appear to have progressed their demonstration project.

29.1.62. No marketing data has been provided. It is unlikely that privately owned diesel HGVs will be replaced in the short term. No network of refuelling sites has been identified. Public Service Vehicles may be the main market.

29.1.63. Few will be employed when the plant is constructed.

29.1.64. How will the balance be struck between export to the grid and export to the interconnector? The electrolyser may be inefficient by the time the market develops.

29.1.65. The *National Hydrogen Strategy* recommends that baby steps are needed in this new field. The proposed development is not in keeping with the strategy, which envisages hydrogen plants near ports, roads, industry and research bases.

29.1.66. *Noel and Lisa Ruane*

29.1.67. Ms. Leona Mulrooney represented the Ruanes, who live some 300 metres from the hydrogen plant. Construction issues in relation to traffic and dust, particularly the health and safety of children, who suffer from respiratory difficulties, and their ability to walk to and from the school bus independently were of concern. Vibrations may damage the newly constructed dwelling. The noise and dust from drilling the boreholes and the illegal roadway (and its removal) was excessive. Livestock would be affected. Reassurance is sought on devaluation and insurance.

29.1.68. *Judd Ruane*

29.1.69. Mr. Ruane runs an international fishing business, since 1974. He has also assisted the IFI with survey work. The Moy Estuary is one of the last, great sea trout estuary left in the country. The proposed development is in the wrong location and will negatively impact on the spawning beds for salmon and sea trout, due to silting. These beds are only a few feet wide. The Brosna River begins with a number of small tributaries, which is the primary spawning grounds for Moy sea trout. The EIAR has

not referred to sea trout and electorfishing showed poor results. The IFI have published a paper on the population structure and genetic stock identification of the Moy Catchment Brown Trout in 2023. Rehabilitation and enhancement works by the IFI have taken place in the Glenree at seven locations, which are part of the system.

29.1.70. The Dooyeaghny river was electrofished last July and salmon, sea trout and eels were found. IFI funding is in place for similar work next July. The river is in reality a stream, and this is where the discharge from the plant is to go. Once mistake in monitoring could be a disaster for fish life.

29.1.71. *Damien Ruane*

29.1.72. Dierdre Burke represented Mr. Ruane. His concerns are about the tube trailers. If these are detachable from their cabs, and if the cabs are gone, in the event of an emergency, they cannot be moved. There is no information on passing bays on the L6612.

29.1.73. If the internet fails, how will the plant be adequately monitored?

29.1.74. The area has a number of SACs in the environs of both the wind farm and hydrogen plant. Climate change will impact on birds and fish. They will be trapped in an unforgiving environment. If water supply is required from the mains, then that means the water in the area will be severely depleted. Livestock need water and water abstraction will severely affect this.

29.1.75. Children will have to be kept at home during the construction of this project, due to traffic on the road. They will be prevented from using the roads over 21 months. This level of inactivity could affect their health.

29.1.76. *Niall Fox*

29.1.77. Mr. Fox is a dairy farmer beside the hydrogen plant. He has significant concerns about safety. The risk contours affect his lands. He farms these lands, has contract workers and his children will be on these lands. Livestock will be grazing. He is unhappy that information was published about his business in the planning documents, which is incorrect.

29.1.78. The N59 is hard to access with large, agricultural vehicles with the level of traffic on it, particularly during the summer. The addition of 4 to 5 HGVs per hour will have a significant impact on the road.

29.1.79. As a dairy farmer, he is reliant on a well for his animals. Minerex monitored the levels in his well, which showed no impact. However, over time this may not prove to be the case. It seems impossible to believe, given the volumes of water to be abstracted, that there will be no impact on farming and on the bogs in the area. He said that while early warning systems will be in place, what will happen if they do. Does the plant stop? Will water be taken from the mains.

29.1.80. *Deirdre and John Bourke*

29.1.81. Ms. Bourke discussed the stress experienced locally about the project. She welcomed the submission by Mayo County Council. Have the two planning authorities met to consider how the project will affect both counties? Other counties will be affected by the turbine route.

29.1.82. How will the grid adjust if the wind farm electricity is diverted to the hydrogen plant?

29.1.83. Some 390 vehicle movements would pass her home per day over 11 hours. This will cumulatively affect foundations.

29.1.84. Ms. Bourke referred to Mayo County Council's submission and their concerns about uncertainty regarding road widening and impacts on local biodiversity and land ownership. She is concerned about Knockbrack Bridge being able to take the loads and also the traffic diversion routes referred to above. The local roads are not fit for purpose.

29.1.85. The proposed turbine heights will be significantly taller and will have significant visual impact. Everyone will be affected by it.

29.1.86. The need to drive to between their landholding and cattle movement, farm machinery on the construction haul route. Previous experience of construction traffic from the existing wind farm and quarrying. There are 5 cables to be installed on the road, with poor reinstatement will lead to a poor surface quality. Are land ownership rights to the centre of the road overridden by new legislation. Has the carbon footprint of construction traffic been accounted for? The blades will not be recyclable.

29.1.87. There was limited time to read the Mayo County Council submission.

29.1.88. *Francis Kavanagh Observation*

29.1.89. Mr. Kavanagh stated that he was invited but declined to be part of the project. The HGVs will be run on diesl, rather than hydrogen. He lives some 2 km from the wind turbines and is concerned about visual impact, due to the height of the turbines. The house will be devalued. The hydrogen plant may prevent houses being built. He does not believe that there is a market for hydrogen, given its cost in the UK at £22 per kilogram. The proposed development is premature. The demand for water is excessive. Lakes may be affected and their associated biodiversity. He quired who has responsibility if a cyclist falls, the landowner or the developer?

29.1.90. *Jennifer Harrison Observation*

29.1.91. Ms. Harrison was represented by Mr. Tom Tuffy. It emerged that Ms. Harrison had made two observations, but one had not been sent to the applicant by the Board. This was rectified at the hearing.

29.1.92. Ms. Harrison considered that the wind farm element of the project was well considered but that the hydrogen plant element was less developed, due to its switch from being adjacent to the wind farm to its current location. The surveys are not as comprehensive at Carrowleagh and did not include a bat survey in the season where the bats are active. Her questions in relation to traffic remain unanswered. Her children will be affected by the proposed development's traffic.

29.1.93. Ms. Harrison has turbary rights adjacent to the location of the proposed spoil disposition area and is concerned that there could be water run off from the spoil that would impact on her plot. She is unclear as to the ownership of the plots and their extent. There are implications in relation to the blocking of drains on adjacent or downstream plots, which cannot be gauged. Landslides could be triggered. The footprint is unclear. Is it road rights or a blanket ban on the bog area. How will she be able to access her plot, given the level of construction traffic? Traffic cannot pass on bog roads. While technically there may be access to the bog, it may not exist in reality during construction.

29.1.94. *Edel Gallagher*

29.1.95. Ms. Gallagher lives in HH21. She was affected by the dust and noise during the drilling process. The road was unauthorised and Sligo County Council requested the applicant to remove the road. She echoed Mayo County Council's concerns about visual impact arising from renewable energy and the impact on archaeology.

Residents will be affected the most. She was particularly concerned with the safety if cyclists on the Eurovelo Route 1, given the width of the roads and the need for HGVs to travel these roads, during the construction phase. The road diversions would increase the safety risk for cyclists. The international cycle route, over 10,000 km long and crossing six countries, passes the wind farm entrance. The road was chosen due to its safety, picturesque nature, archaeology and wildlife. The N59 is too dangerous for cyclists. There are two SACs in the area and wildlife will be displaced.

29.1.96. The local aquifer will be dewatered over time. How will it be replaced?

29.1.97. Again, devaluation will be an issue. The land is ancestoral and it is hoped that grandchildren will be able to build in the area. It is very personally distressing.

29.1.98. *Applicant's Response*

29.1.99. Mr. O' Neill suggested that the Board allow time for the observers consider the applicant's second submission and submit written responses. A letter was provided in relation to household insurance. Household insurance will not be affected by the presence of the hydrogen plant. It has not impacted houses adjoining Ballina Beverages, also a COMAH site. A letter confirming this was submitted from Romero Insurance Brokers.

29.1.100. In relation to passing bays, all be but two are in existence and consents are in place for these. No consent will be required from landowners on the public road as these works will be completed by a statutory undertaker, as set out in the Planning and Development Regulations, as amended. This is not unusual – the local authority has rights under the Roads Act, the ESB under the 1927 Act and Uisce Eireann have similar.

29.1.101. Mr. John Curtain of EirEcology, is particularly familiar with the wind farm site since 2012. His company had been using dogs for corpses search since 2015. The application has relied on Scottish Nature wind farm guidance from 2019. The level of bat activity on the site varies, dependent on species. The Liesler Bat is moderate to high; the common pippestrelle moderate and Natusler's Pippestrelle low to moderate. The application is considered large scale, due to the existing wind farm adjacent to the site.

29.1.102. There are strong bat mitigation measures proposed. Feathering and curtailment measures will be used. Turbines will be turned off for 30 minutes after sundown from April to October, when temperatures are above 11 degrees Celsius, when bat activity is high and wind speeds are 5 m/sec or lower. Curtailment measures will be applied to all turbines, save for T4 and T10. He has been involved with a wind farm that uses curtailment as a mitigation measure. In the first year, without mitigation, 3 bat corpses were found. The next year, where curtailment was introduced, no bat corpses were found in a 200 day survey. This approach will be adopted in this wind farm. The mitigation measures can be adapted to suit the particular circumstances, to prevent bats from being impacted.

29.1.103. He stated the bat survey for the hydrogen plant location was a roost survey, was undertaken at the right time of year, as it related to identifying trees that may contain bat roosts. This is normally done when the trees are not in leaf. All trees will be inspected again for bat roosts, prior to commencement of development, under a derogation licence.

29.1.104. The relevant expert in aquatic life was not available on the day to respond to observations, but this is dealt with in the responses to submissions.

29.1.105. Ms. Jones of JODA referred to the consultation process. It took place over two and half years and the project changed over time. She stated that originally, the hydrogen plant was to be located at the same site as the wind farm. However, due to the consultation process and absence of groundwater on the site, in May, 2022, the hydrogen plant was relocated to the current site proximate to the N59. Public Information Days were held. These were advertised extensively, through leaflet drops, posters, newspapers, etc. People were invited to contact the company directly, as Liaison Officers were appointed. A project website was set up. Individuals also organised a public meeting about the project, to which Mercury Renewables Ltd. were not invited, but offered to provide information.

29.1.106. An informal meeting of local landowners was held in Muddy Burns and was limited in numbers, but this meeting was not intended to a public meeting.

29.1.107. Mr. Kiely of JODA confirmed that the number of truck trailer movements would be 52 and that the applicant was committed to not exceeding this number.

29.1.108. Mr. Ben Stephenson stated that the applicant's team has significant expertise in the design and operation of hydrogen plants on an international basis and that the design will become more detailed as the project develops. There is expertise in Ireland. This will be overseen by the HSA and the EPA, both of which will regulate its operation.

29.1.109. Mr. David Keily of JODA discussed the mitigation measures to prevent silt and dust from entering the watercourses around the wind farm. Only experienced contractors will be used. Design mitigation has been built in. Clean water will be channelled away from working zones. Dirty water will be treated in silt ponds. These are monitored and silt busters are used if this is not effective. The water moves to attenuation ponds, then defuse buffers to discharge.

29.1.110. Wastewater from the hydrogen plant will be treated and stored before discharge. The water is monitored before entry to the constructed wetlands. The outfall will also be monitored for flow and quality. If the flow in the receiving water is too low, it will not be discharged. The hydrogen plant will be licenced by the EPA and plant staffed on a 24 hour basis. Monitoring will be real time. If the internet fails, there will be people to make the decision and switch off the discharge.

29.1.111. Mr. Andy Lipston of Risktec Solutions Ltd. reiterated that the maximum level of risk of fatality allowed be imposed on a member of the public in permanent occupied location is a one in one million risk. No buildings come within this range, but the farm land adjacent to the plant does. However, the contour line is based on the assumption of 100% occupancy, 24 hours a day, 7 days a week. The risk to farm workers relates to the percentage of the time spent on the land.

29.2. ***Day Two***

29.2.1. *Michael Ormsby*

29.2.2. Ms. Ni Dhuinneachair represented Mr. Ormsby. Mr. Ormsby is a bus driver, living 1.3 km from the site and uses the N59 daily. He considers it a very dangerous road. He is aware of 2 accidents at the L66121 junction with the N59, as you have to cross the white line to make the turn. He queried the suitability of the local roads for traffic diversions during the construction period, which he considers dangerous. The population is growing in Ballina and a bypass is planned. The proposed development might use this in the future.

29.2.3. In relation to water abstraction, he noted how Grenoble has recently had to limit access to groundwater to prevent water shortages.

29.2.4. *Ronan Carrabine*

29.2.5. Ms. Ni Dhuinneachair represented Mr. Carrabine. He had planned to build a house in the area and is very unhappy. The valuation of property and risk assessment were the main concerns. One in a million risk of fatality is one too many.

29.2.6. *Michael Browne*

29.2.7. Ms. Ni Dhuinncachair represented Mr. Browne. The presentation included a radio interview which took place in December 2021, which could not be heard at the hearing. The project at the time was based in Carrowleagh only. However, details are sent in as part of the oral hearing presentation. It included commitments to fixed fuel prices for green hydrogen for 15 years. There was no consultation in Caurran until May 2022.

29.2.8. It was asked where the measurements from the hydrogen plant were taken. Mr. Bowne has land directly across from the red line boundary at the N59. Extra traffic will make their farm work more hazardous. The errors in the reports calls into question the project. The size of the hydrogen plant was compared to standard agricultural buildings.

29.2.9. *Theresa and Patrick Morrell*

29.2.10. Mr. Michael Reddington represented the Morrells. He was concerned about the split between the demand for electricity from Eirgrid and demand for hydrogen and the associated complexity of fluctuation of supply. He questioned how the switching would be managed and which would take priority. There appeared to be no evidence in place for an agreement in principle with Eirgrid.

29.2.11. He referred to the reliance on HGVs for the distribution of hydrogen and that this is significantly more expensive than piping it, which will impact on price. He noted that the hydrogen purity 2019 standard ISO 14687 of a very high purity (99.97%) and questioned whether the hydrogen produced would meet this standard.

29.2.12. The plan to scale up production on a phased basis will still require the complete build out of the plant. He questioned the length of the permission (ten years), given the requirements to meet 2030 targets and the risk of the technology being outdated by this time. He has been unable to find an operational green hydrogen plant in the

country. He considers that there are too many unknowns, as indicated in the national hydrogen strategy. He questioned the community benefit of €500,000 p.a., whether this was likely to materialise, given the absence of a market and high production costs and how it would be shared between the two counties. He considers that the promise may be difficult to deliver, but may have influenced the numbers of persons not objecting to the proposed development.

29.2.13. He suggested that Ireland would be better importing hydrogen until the market matures and gave reasons why the application should be refused. These relate to uncertainty in relation to construction, technology, economic reasons and the future market.

29.2.14. *Val O'Gorman*

29.2.15. Mr. O'Gorman lives in HH16. He has similar concerns in relation to devaluation of property and would like to see an independent appraisal. He noted that the EIAR recognises this happens to housing but did not reference hydrogen plants.

29.2.16. He questioned traffic movements and would request a condition to limit truck movements to 07:00 to 19:00 per day. He considers more than 52 HGV movements will arise, due to the logistics of operation. He contends that living beside the hydrogen plant will be akin to a quarry and his quality of life will be diminished, and with the loss of tranquility, he will be forced to leave. He notes that the tube trailers doesn't exist and queries what pressure they will be working under. He notes that the noise from the vehicles will increase as they gear up, leaving the site.

29.2.17. *Applicant's Response and Questioning*

29.2.18. Mr. O'Neill objected to suggestions that there are untruths or lies in relation to the information provided by Mercury Renewables or their advisors.

29.2.19. He confirmed that HGV movements are confirmed to be 26 no. x 2 per day, operating between 07:00 and 19:00 and this is committed to, by way of condition.

29.2.20. Ms. Jones, in response to Ms. Harrison's second submission, gave further details on the consultation process. Ms. Harrison contended that the bulk of consultation occurred in Mayo rather than Sligo. Ms. Jones gave further details on consultation in Sligo, which included a public information day in September, 2022,

where over 100 persons attended. The meeting at Muddy Burns was informal, but it has attracted adverse comment.

29.2.21. Ms. Harrison's turbary plot is not within the development footprint or part of the material spoil disposition area.

29.2.22. Mr. Stuart Summerfield of CST confirmed that the 12 recommendations made in the Road Safety Audit were adopted in the drawings. The audit team are independent from the design team. The safety of the junction will be improved for all users.

29.2.23. Mr. Stephenson discussed hydrogen purity. In relation to the balancing query to demand on the grid, demand for the grid is heaviest in the morning and the evening, so hydrogen will be produced during periods of low demand on the grid. If there is no demand for either product, the wind turbines can be curtailed. Eirgrid do this at present, so it is not a new technology.

29.2.24. He acknowledged that the hydrogen refuelling stations referred to in the National Hydrogen Strategy will require hydrogen at 700 bar pressure on the European motorway routes for cars, the majority of buses and HGVs will operate at 350 to 400 bar pressure. The hydrogen produced will be 99.99% pure, due to the downstream cleaning process after the hydrogen has been produced, which can be used in fuel cells, which require 99.7% purity.

29.2.25. Mr. Tim Bills of Mercury Renewables stated that the community benefit fund would operate in line with the guidance set out in the Renewable Electricity Support Scheme, as per industry best practice.

29.2.26. Mr. Ian Bailey from Sligo County Council stated that concern remains in relation to the impact of the proposed development in terms of the effect on the carrying capacity of the N59 due to increased traffic volume, and the need to preserve this capacity as outlined in council policy, CDP PNR 1. Elected members noted that TII advice in the past would not allow for access for single dwellings, but that TII did not advice against the proposed development, which involves larger, slower moving vehicles onto the national road network.

29.2.27. No planning application has been received for the demolition of the dwelling or farm buildings or for their replacement.

29.2.28. Sligo County Council commenced enforcement action for the road constructed during the drilling process. The council was satisfied that with the remediation action undertaken to remove the road.

29.2.29. Mr. Keily noted that the traffic generated by the proposed development was of the order of 2% and so the impact was limited on the N59. In an accompanying written submission, permissions referring to wind farms that were located directly onto national roads were identified. The impact on the national road is not considered material and has to be weighed against the provision of a safer junction.

29.2.30. Ms. Jones said that the application before the board includes the demolition and part demolition of agricultural sheds. It does not include for demolition of the house. However, the EIAR has assessed the demolition of the house. The planning application to demolish the house will follow a decision on this application.

29.2.31. Mr. Keily stated that the fire certification process normally occurs after planning permission is granted. Discussions have been held with the Fire Officer in advance of the planning application. The IED licence will be applied for as well. It will not include the wind farm.

29.2.32. Mr. Barker of Macro Works confirmed that the proposed wind farm is fully located in the Tier 1 area for large wind farms in Mayo. In relation to questions regarding the increased height of the turbines over that permitted, he noted that the height being sought is consistent with turbines of the current generation. The existing turbines reflect an earlier generation turbine. He stated the Board has permitted similar heights to that sought in the current applications in north Mayo. There is a consistent trend of taller turbines.

29.2.33. Existing wind farms, now reaching their fourth decade will need to be repowered and turbines will be taller. Fewer may be erected. A ‘leapfrogging’ effect will be seen in the landscape. It would be of concern if older generation turbines would dictate the heights of turbines. The current landscape can cope with the increased height. The increased height with fewer numbers of turbines (13 no.) is considered visually more acceptable that 21 no. turbines, as previously permitted on site. Indeed, contrary to the view of Mayo County Council, the presence of the existing wind farm on the adjacent site with the smaller turbines will help assimilate the taller wind turbines, as

a sense of perspective will be introduced. Scale confusion may arise when the farther turbines are higher. That only arises on one occasion in this instance.

29.2.34. The distant viewpoints where the turbine tips break the skyline with the Ox Mountains behind are not a significant impact. If the turbines were visible with the Ox Mountains intervening, that would of concern. The breaking of the skyline as currently presented does not cause 'visual irritation'.

29.2.35. Ms. Jones responded to the issue of co-location of the hydrogen plant with its end-user. In relation to co-location of hydrogen plants near large industrial plants, this is for the decarbonisation of these industries and in EU rules, this is considered an 'off-grid' development. However, when the hydrogen is from an 'on grid' connection, the hydrogen needs to be certified as being renewable. This has to come from new and additional capacity. Existing renewable energy cannot be diverted to hydrogen production. Green hydrogen must be linked to its own renewable energy asset.

29.2.36. In relation to the haul routes and certainty in regard to impacts on biodiversity and public ownership of roads, Ms. Jones stated that the swept path drawings for the delivery of the turbines have been supplied and the impacts of the road widening have been assessed in the EIAR. The necessary consents were submitted where required.

29.2.37. Ms. Jones referred to potential future changes in local planning policy and the review of the renewable energy strategy for Mayo. She noted that the application has to be assessed on the policy in place at the time when the decision making is made. There is no draft of a new policy available. It is not anticipated that there would be significant change to the areas, if the same sieve mapping approach was employed.

29.2.38. Mr. Lipstone confirmed in relation to the risk contours of the QRA that was no change to the contours between the QRA produced in June, 2023 and January, 2024. In relation to damage to housing in a worst-case scenario, at 350 metres away from the event, Mr. Lipstone considers that it would be considerably less than 168 bar pressure.

29.2.39. In relation to the amount of water required to produce 1 kg of hydrogen, Mr., Stephenson stated that 13 to 14 litres of water are required to produce 1 kg.

29.2.40. As regards the loss of recharge to groundwater from the site at present to if the project was built out, Mr. Cecil Shine of Minerex stated that the denial to recharge

arising from the proposed development would be circa 20% less of rainfall than would otherwise contribute to groundwater. The groundwater requirements are set at a Factor of Safety of 1.5 and wells will not be affected. Therefore the supply to the proposed development will be sustainable.

29.2.41. *Jennfier Harrison Response*

29.2.42. Mr. Tom Tuffy said that in December 2021, the whole project was in Mayo and people were unaware of the change to Sligo. Leaflets are considered junk mail and tend to be ignored. Concern remains in relation to the incorrect road reference for a SID project. The footprint of the development is unclear; landslides could occur. The absence of extensive bat reports on the hydrogen plant site is indicative that this element of the project is not as well considered.

29.3. *Closing Statements*

29.3.1. The observers reiterated concerns were reiterated about the need for unfettered ambulance access, noise and vibration from trucks, the nature of the community benefit, the recharge rate and the aquifer not being in balance due to the denial of recharge, potential for an event on site and concerns for future family members being able to live on family lands. Questions remain about safety.

29.3.2. Sligo County Council did not make a closing statement.

29.3.3. The applicant noted that the HSA is not likely advise against housing outside the blue contour. The dedicated phone line will be resourced and any medical emergency will be facilitated. Switching technology for electricity transmission and curtailment is available. The terms of the community benefit will be set by DECC. The state has a need to decarbonise and the EU has sought accelerated deployment of renewable energy. Wind farms are presumed to be IROPI. There is a legally binding target of net zero by 2050. The EPA has warned that Ireland is already falling behind on meeting 2030 targets, which is a 51% reduction.

29.3.4. While the market is young for hydrogen, it is essential for decarbonisation. The wind farm is in an area where the location is preferred in the *Mayo County Development Plan*, 2023-2028. The wind farm has precedent in planning terms. Sligo County Council has supported the principle of development. There are no significant negative

impacts identified in the EIAR. The hydrogen plant will be regulated by the HSA and EPA.

29.3.5. *Inspector's Comments*

29.3.6. The proximity in date of information received by the Board in relation to the submission from Mayo County Council and the First Party's Second Response immediately prior to the hearing and the changes to the information posted on the Board website was brought to my attention at the Oral Hearing. At the hearing, a number of new drawings were submitted, including 6129-ABP OH-005, which shows an enlarged blue line over land which is in the control of the applicant. I suggested at the Hearing that the new information be re-advertised. Neither the First Party nor the Observers considered this necessary. However, I consider that the confirmation of control of lands external to the site, for the purposes of the proposed development, is significant and requested that new notices be issued. The Board may also consider re-opening the Oral Hearing.