# 23. Schedule of Environmental Commitments

As set out in Chapter 1 of this updated EIAR, this is an update to Chapter 21 of the EIAR submitted to An Bord Pleanála in October 2018 as part of the application for approval of the proposed N6 GCRR pursuant to Section 51 of the Roads Act 1993 (as amended). The Schedule of Environmental Commitments now falls under Chapter 23 of this updated EIAR, as air quality and climate are now considered separately in standalone chapters, as does waste, all of which precede this chapter. It forms part of the response to the request by ABP for further information in December 2023 where they (in addition to a number of other requests) requested GCC to "*Update the Environmental Impact Assessment Report*". This chapter collates all of the design and mitigation measures (referred to in this chapter as Environmental Commitments) to be implemented during the construction of the Project, to reduce/avoid as far as practical significant impacts on the receiving environment. It is an update of the Schedule of Environmental Commitments submitted to ABP on 4 November 2020 at the end of the oral hearing. Where there have been any changes or updates have been made since the oral hearing in 2020 these are shown in blue text. Where chapter numbers have changed since the 2018 EIAR, the reference number has been updated to reflect the new chapter number.

The following environmental commitments are an integral element of the application for Approval. Further work will develop the design of the Project in a manner such that there is no material change in terms of significant adverse effects on the environment. Opportunities may be identified to further reduce the significance of adverse impact and, in some cases, improve the residual impact. In this way the design measures, mitigation strategies, objectives and implementation measures set out below may be refined so to provide the optimum solution based on available construction techniques and technologies at the time of construction.

Best practice and good construction practice when referred to in this document refer to measures contained in modern guidance documents which set out the practice and procedures for environmental protection during construction and operational phases of a Project.

Where Legislation, Standards or Guidance Documents are referred to it should be noted that at the time of construction or operation of the Project any amendments to these documents are applicable.

This section provides a summary of the main commitments under each of the environmental headings listed. Full details of the various commitments should be obtained by reference to the individual chapters of this updated EIAR as a whole.

In the following tables "C" denotes a commitment which refers mainly to the construction phase and "O" denotes a commitment which refers mainly to the operational phase of the Project.

## 23.1 General

| Ref. No. | Stage | Commitments |
|---|---|---|
| 1.1 | C | Contract documents will include a requirement for the Contractor to update and finalise the Construction Environmental Management Plan (CEMP) (Appendix A.7.5) for the Project prior to construction once appointed and to implement and maintain it during the construction phase. |
| 1.2 | C | The final Schedule of Environmental Commitments will be included in the CEMP. The CEMP will detail implementation methodologies for all environmental commitments. |
| 1.3 | C | There will be a contract management team appointed by the client on site for the duration of the construction phase. The team will supervise the construction of the works including monitoring the Contractor's performance to ensure that the proposed construction phase environmental commitments are implemented and that construction impacts and nuisance are minimised. |
| 1.4 | C | The construction management team will liaise with neighbours and the general community during the construction phase to ensure that any disturbance is kept to a minimum. |
| 1.5 | C | The Contractor's team will include an Environmental Manager (EM) who will be responsible for implementation of the Construction Environmental Management Plan (CEMP) during construction. The EM will draw up a schedule of monitoring required, listing the type of report expected and detailing to who the reports should be sent, etc. It is the responsibility of the EM to ensure that all monitoring is carried out by competent persons. Where the monitoring results fall outside the range contractually required, the EM is responsible for initiating and reporting on corrective action. This may require the alteration of relevant Environmental Control Measures.<br>The EM will provide a briefing for all of the Contractor's senior management including the Project Manager, Programme Manager, Construction Manager, Design Engineers, Structures Agents and Site Agents on the CEMP and the Environmental Commitments/Requirements that must be met during the construction phase. The Employer's Site Monitoring Team will be monitoring compliance with the CEMP. |
| 1.6 | C | Pollution control measures will be installed upstream of each outfall from the Project. These measures will include an appropriate combination of filter drains, attenuation ponds, swales, petrol and oil interceptors, wetlands and infiltration trenches/ponds (refer Chapter 5 of this updated EIAR). |
| 1.7 | C | When the Project is in cutting or on embankment less than 1.5m high, combined filter drains will be provided. Where the Project is on embankment between 1.5m and 6.0m, carriageway runoff will be picked up in surface water channels alongside the carriageway. |
| 1.8 | C | Where filter drains and swales cannot be used, alternative forms of vegetated pollution control will be employed prior to outfalling to surface waters such as treatment wetlands. |
| 1.9 | C | Treatment wetlands will have a permanent pool of minimum depth and a volume to cater for the first flush rainfall event. |
| 1.10 | C | In areas of extreme or high vulnerability groundwater areas or karstified areas, sealed drainage systems will be used. |
| 1.11 | C | Flow restriction and attenuation storage measures will be provided at each surface water outfall from the mainline and link roads of the Project. |
| 1.12 | C | Attenuation ponds will cater for storm events up to the 1 in 100-year storm period event. An overflow discharge facility will be provided for storm events in excess of 1 in 100-year return periods. |
| 1.13 | C | Petrol/Oil Interceptors will be employed at every outfall from the mainline and link roads of the Project. |
| 1.14 | C | A minimum emergency spillage containment volume of $25m^3$ will be provided at all outfall locations from the mainline of the Project as per DN-DNG-03022. |
| 1.15 | C | Side roads (regional, local and minor access roads) with kerbs will be drained using gullies with carrier drains or combined filter/carrier drains.<br>Piped drains will discharge to an outfall, a sealed drain, sufficiently sized existing drainage systems, a ditch, a swale or to the mainline drainage system. Where topography and surface watercourse conditions dictate, a soakaway or infiltration trench/basin may be required. |
| 1.16 | C | Side roads that do not require kerbs will be drained using either over-the-edge drainage or combined filter drains. The surface water will discharge to a sufficiently sized existing drainage system, an outfall, a sealed drain, a ditch, a swale or to the mainline drainage system. |
| 1.17 | C | Access will be provided to all elements of the drainage system including the spillage containment facilities, the pollution control and the attenuation ponds. |

| Ref. No. | Stage | Commitments |
|---|---|---|
| 1.18 | C | Throughout the course of the construction of the Project, on-going visual inspections and monitoring of the haul routes along public roads will be undertaken to ensure any damage caused by construction traffic is recorded and that the relevant local authority is notified. Arrangements will be made to repair any such damage to an appropriate standard in a timely manner such that any disruption is minimised. Upon completion of the construction of the Project, the surveys carried out at pre-construction phase shall be repeated and a comparison of the pre and post construction surveys carried out to determine any sites requiring remediation work post construction. |
| 1.19 | C | All project staff and material suppliers will be required to adhere to the Construction Traffic Management Plan (CTMP). As outlined within the CTMP, the Contractor shall agree and implement monitoring measures to confirm the effectiveness of the CTMP and compliance will be monitored by the resident engineer on behalf of the client. Regular inspections/spot checks will also be carried out to ensure that all project staff and material supplies follow the agreed measures adopted in the CTMP. |
| 1.20 | C | Any structural damage caused to buildings/structures/wells as a result of the construction will undergo a full stabilisation and rehabilitation works. |
| 1.21 | C | The following are the measures that will be taken to ensure that the construction site and surroundings are maintained to a high standard of cleanliness:<br>Daily inspections will be undertaken to monitor tidiness.<br>A regular program of site tidying will be established to ensure a safe and orderly site.<br>If necessary, scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind.<br>Food waste will be strictly controlled on all parts of the site.<br>Wheel wash facilities will be provided for vehicles exiting the construction site. Wheel wash run off will be stored in an onsite storage tank and will be disposed of by permitted waste haulage company at a permitted or licensed facility.<br>In the unlikely event that mud is carried from the construction site to the public road, it will be cleaned as required and will not be allowed to accumulate.<br>Loaded lorries and skips will be covered if required.<br>Surrounding roads used by trucks for access to and egress from the site will be inspected regularly and cleaned, using an approved mechanical road sweeper, when required.<br>In the event of any fugitive solid waste escaping the site, it will be collected immediately and removed to storage on site, and subsequently disposed of in the normal manner. |
| 1.22 | C | A Pest Control Plan (PCP) has been developed to implement pest control measures during construction of the Project and this will be incorporated into the CEMP. A summary of the measures included in the PCP are outlined in the Statement of Evidence – Responses to Engineering, Need for the Project, Alternatives Considered and Material Assets Non-Agriculture Objection/Submissions as read into the record on day one of the oral hearing on 18 February 2020. |
| 1.23 | O | A 2m cycle track will be provided from Gort na Bró Roundabout to Gael Scoil Mhic Amhlaigh on both sides as shown on Drawing GCRR-SK-OH-054 included in Appendix A.21.1 |
| 1.24 | O | A two-way cycle track will be provided from Gael Scoil Mhic Amhlaigh to Rahoon Road on the eastern verge of Gort Na Bró Road. |
| 1.25 | O | Galway County Council propose that plots 583a.209, 583c.201, 583c.202; 583c.203 and 583a.208 are temporary plots, required only for the duration of the construction period for use as a part of the overall construction compound and to enable construction of the Project. A right of way will be provided over Access Road AR 11/01 in favour of McHugh Properties to provide access to these lands. |
| 1.26 | O | A 10m wide right of way will be provided by Galway County Council in favour of the landowner in Plot 570 to facilitate access between the northern and southern land parcels under Menlo Viaduct. |
| 1.27 | O | Galway County Council propose that plot 717a.201 is removed from the N6 Galway City Ring Road Motorway Order 2018. |
| 1.28 | O | A 10m wide right of way will be provided by Galway County Council in favour of the owner of lands bounded by Folios GY123020F, GY21502F and GY109981F to facilitate access to/from those lands to/from Menlo Castle Boithrin across Plot 765c.201 |
| 1.29 | O | A right of way will be provided over The Heath's existing access road (excluding the newly constructed access road AR 07/10) by Galway County Council in favour of properties at the Heath. |
| 1.30 | O | An agricultural right of way (to pass and repass with or without vehicles but without livestock on foot) will be provided over The Heath's existing access road and the newly constructed access road AR 07/10 by Galway County Council in favour of the landowners of Plots 504 and 506. |

| Ref. No. | Stage | Commitments |
|---|---|---|
| 1.31 | O | A right of way will be provided over Aughnacurra's newly constructed access road AR 08/03 by Galway County Council in favour of the properties at Aughnacurra. |
| 1.32 | O | A right of way will be provided over Aughnacurra's existing retained access road by Galway County Council in favour of the properties at Aughnacurra. |
| 1.33 | C | Galway County Council will pay for similar alternative accommodation for the Kerin's family (Ard na Locha) to be rehoused during the duration of the 9 months earthworks period at the N59. |

## 23.2 Waste

| Ref. No. | Stage | Commitments |
|---|---|---|
| 7.1 | C | Waste generated during the construction phase will be carefully managed according to the accepted waste hierarchy which gives precedence to prevention, minimisation, reuse and recycling over disposal with energy recovery and finally disposal to landfill. |
| 7.2 | C | The waste hierarchy will be implemented by identifying opportunities to firstly prevent waste from being produced, and secondly minimise the amount of waste produced. |
| 7.3 | C | Where prevention and minimisation will not be feasible, ways to reuse or recycle waste will be sought, preferably on-site to avoid the impacts arising from transportation. If this is not feasible, opportunities to reuse or recycle the waste off-site will be investigated or waste will be sent to an energy recovery facility, and only where there is no alternative, will waste be disposed of to landfill. |
| 7.4 | C | All waste removed from the site will be collected only by Contractors with valid waste collection permits, under the Waste Management (Facility Permit and Registration) Regulations 2007 and (Amendment) Regulations 2008, 2014, 2015. All facilities to which waste will be taken will have appropriate waste licences or permits, under the Waste Management Acts 1996 - 2011, and the regulations thereunder, allowing them to accept the type of waste that is to be sent there. |
| 7.5 | C | Hazardous waste generation will be minimised, and such waste will be recovered where feasible, and only disposed of if recovery is not feasible. Hazardous waste will be managed in accordance with the relevant legislation. |
| 7.6 | C | All wastes from the construction of the Project will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996-2024. By only using facilities with the appropriate waste permits/licence, Galway County Council will be satisfied that the Contractor will comply with the objectives of the Waste Management Act and that any environmental emissions (noise, dust, water) are managed at the destination site and therefore are legally the responsibility of the owner/operator of the destination site. In this manner Galway County Council can be satisfied that the off-site spoil management aspect of the development is legally compliant with environmental and waste management legislation. |
| 7.7 | C | In general, construction waste materials may include general construction debris, scrap timber and steel, machinery oils and chemical cleaning solutions. The practice of excessive purchase of materials and equipment to allow for anticipated wastage will be avoided. |
| 7.8 | C | The Construction and Demolition Waste Co-Ordinator will arrange for a waste audit of the Project once construction has fully commenced on site and of any facilities to which waste from the Project is delivered as required. The Employer will receive summaries of any audit reports which will be completed within three months of the end of each calendar year. The effectiveness and accuracy of the documentation will be monitored on a regular basis via routine site visits. |
| 7.9 | O | Operational waste will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996 - 2024. |
| 7.10 | O | Following construction, the Non-native Invasive Species Management Plan will be updated for the operational phase, taking into account the results of the detailed construction non-native invasive species management plan and operational maintenance requirements. Follow on treatment methods such as chemical treatment may be employed if specified in the requirements for ongoing control. |
| 7.11 | C | Opportunities for reuse of materials, by-products and wastes will be sought throughout the various phases of the Project. |
| 7.12 | C | Non-hazardous excavation material will be sent for recycling or recovery. |

| Ref. No. | Stage | Commitments |
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| 7.13 | C | Excavations of made ground (comprising a mixture of tarmac, concrete, plastics, ballast materials and silica sand) will be monitored by an appropriately qualified person to ensure that any hotspots of possible contamination are properly identified, with the contaminated material segregated and disposed of appropriately. |
| 7.14 | C | Any identified contaminated material will be segregated and stored in an area where there is no possibility of runoff generation or infiltration to ground or surface water drainage. Care will be taken to ensure that the hotspot does not cross contaminate clean soils elsewhere throughout the site. |
| 7.15 | C | If encountered, any potential asbestos during the construction phase will be managed using standard health and safety measures as outlined in 'Asbestos-containing Materials (ACMs) in Workplaces: Practical Guidelines on ACM Management and Abatement'[1]. This document states that "removal of asbestos from contaminated soil will require a specialist asbestos contractor for any friable asbestos to be removed" and "a risk assessment by an independent competent person should determine the most appropriate control measures and remediation strategies". |
| 7.16 | C | The site will be maintained to prevent litter and regular litter picking will take place throughout the site. |
| 7.17 | C | Just-in-time' delivery will be used to minimise material wastage. |
| 7.18 | C | Paints, sealants and hazardous chemicals will be stored in secure, bunded locations. |
| 7.19 | C | All staff on-site will be trained on how to minimise waste (i.e., training, induction, inspections and meetings). |
| 7.20 | C | Materials on-site will be correctly and securely stored. |
| 7.21 | C | Where possible, metal, timber, glass and other recyclable material will be segregated and removed off-site to a permitted / licensed facility for recycling. Waste stream colour coding and photographs will be used to facilitate segregation. |
| 7.22 | C | On-site office and food waste arising will be source separated at least into dry mixed recyclables, biodegradable and residual wastes. |
| 7.23 | C | Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain, including photographs as appropriate. |
| 7.24 | C | Segregated skips will be used within a designated waste segregation area to be located in the on-site Construction Compound (particularly for hazardous, gypsum, metal, timber, inert waste and general waste). |
| 7.25 | C | The appointed Contractor will record the quantity in tonnes and types of waste and materials leaving the site during the construction phase. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material, which is recovered, which is recycled and which is disposed of. |
| 7.26 | C | Waste generated on-site will be removed as soon as practicable following generation for delivery to an authorised waste facility. |
| 7.27 | C | The appointed Contractor will ensure that any off-site interim storage facilities for excavation material have the appropriate certificate of registration, waste facility permit and / or EPA waste licence in place. |
| 7.28 | C | Where Regulation 27 notifications are required in relation to the Project, the appointed Contractor will complete and submit these Regulation 27 notifications to the EPA for by-product reuse. |
| 7.29 | C | The relevant appropriate waste authorisation will be in place for all facilities that wastes are delivered to (i.e., certificate of registration, waste facility permit and / or EPA waste licence). |

[1] Health and Safety Authority, 2013. Asbestos-containing Materials (ACMs) in Workplaces. Available at: https://www.hsa.ie/eng/publications_and_forms/publications/chemical_and_hazardous_substances/asbestos-containing_materials_acms_in_workplaces_-_practical_guidelines_on_acm_management_and_abatement.html

## 23.3 Population and Health

| Ref. No. | Stage | Commitments |
|---|---|---|
| 19.1 | C/O | Provide pedestrian crossing facilities at junctions between the proposed N6 GCRR and minor roads serving local rural communities. |
| 19.2 | C | Provide temporary visual and noise screening from construction works at St. James' Church cemetery in Bushypark and at St. James' School, Bushypark. |
| 19.3 | C/O | Provide pedestrian crossing facility at Bushypark Junction with N59 Link Road North during construction and operation |
| 19.4 | C | Avoid any prolonged severance and minimise duration of use by construction traffic of An Seanbóthar. |
| 19.5 | C | Provide for alternative access along the bank of the River Corrib, along with prior advice for walkers, if access restrictions apply due to construction of the overhead bridge crossing.<br>Safe access across the construction site within UoG Sporting Campus will be maintained for the duration of the construction contract. |
| 19.6 | C | Phase construction works to minimise impacts on racing events at Galway Racecourse. |
| 19.7 | C | Provide directional signage for access to car dealership and An Post sorting centre on N83 during construction. |
| 19.8 | C/O | Provide pedestrian crossing facilities at N84 Headford Road Junction during construction and operation. |
| 19.9 | C/O | Provide a footpath within the fenceline of the proposed N6 GCRR along School Road, Castlegar. |
| 19.10 | C | Provide directional signage for a Briarhill Business Park, including a car dealership located here during ~~both the~~ construction. |
| 19.11 | C/O | Take measures to ensure that cul-de-sacs or adjacent lands are not used for illegal parking in the construction and operational phase. |
| 19.12 | C | During construction, all public notifications and all public project updates are provided in both Irish and English languages. |
| 19.13 | C | While it is expected that day-to-day communications involved in the construction of the Project will be through the English language, the Contractor shall have the capacity to communicate and correspond through the use of the Irish language and to devote adequate and proportionate staff resources to dealing with any individual wishing to correspond and communicate through the Irish language. |
| 19.14 | O | Placenames shall be cited in accordance with the relevant Placename Order issued under the Official Languages Act 2003. |
| 19.15 | C | A pedestrian crossing will be installed at the entrance to Lackagh Quarry prior to the commencement of construction works to maintain the greenway. This pedestrian crossing will be maintained by the contractor for the duration of the works. There will be a speed restriction of 15km/h on the access road into the site compound at Lackagh Quarry for the duration of the works. |
| 19.16 | C | Galway County Council will pay for similar alternative accommodation for the Kerin's family (Ard na Locha) to be rehoused during the duration of the 9 months earthworks period at the N59 |
| 19.18 | C/O | A 2m cycle track will be provided from Gort na Bró Roundabout to Gael Scoil Mhic Amhlaigh on both sides |
| 19.19 | C/O | A two-way cycle track will be provided from Gael Scoil Mhic Amhlaigh to Rahoon Road on the eastern verge of Gort Na Bró Road |

| Ref. No. | Stage | Commitments |
|---|---|---|
| 19.22 | C/O | To ensure interconnection for UoG post completion of the construction, GCC will be providing a right of way for UoG to use the lands under the proposed viaduct for sporting/athletic purposes by way of a long lease. |

## 23.4 Material Assets Non-Agriculture

| Ref. No. | Stage | Commitments |
|---|---|---|
| 15.1 | C | In the event of an approval of the Protected Road Scheme and Motorway Scheme and approval under Section 51 of the Roads Act 1993 (as amended), by An Bord Pleanála and subject to the availability of funding, Notice to Treat will be served firstly on owners, lessees and occupiers of the dwelling houses and commercial properties to be acquired, within six months of the scheme becoming operative, unless an application has been made for Judicial Review, in which case the Notice to Treat will be served in accordance with the provisions of Section 217 (6A) of the Planning and Development Act 2000 as inserted by the Compulsory Purchase Orders (Extension of Time Limits) Act 2010. Compensation will be agreed or determined by the property arbitrator as soon as possible after service of Notice to Treat. After compensation has been agreed or determined and satisfactory title has been produced, part payment can be made while the claimant remains for an agreed period in the property to be acquired. This will facilitate the claimant in removing uncertainty and will facilitate arrangements being made, as early as possible, to secure a replacement property. |
| 15.2 | C | Where existing access to property is affected, this will be reinstated or an alternative access provided. |
| 15.3 | C | Where the infrastructure for service providers is impacted, this will be diverted or reinstated in accordance with service providers' requirements prior to construction. |
| 15.4 | C | During construction, restricted access across the construction area at the UoG Sporting Campus facilities will be maintained. |
| 15.5 | C | ~~Alternative pitch facilities will be provided to replace the existing pitches directly impacted by the proposed road development. The facilities include a floodlit 3G GAA pitch and a floodlit 3G training area and associated site infrastructure for the drainage of these pitches and furniture such as ball stop netting.~~ The proposed N6 GCRR intercepts the existing UoG sports pavilion resulting in direct impacts to its western end and the building will be modified as follows:<br>• The existing western plant room, 1 no. changing room, 1 no. storage area, 1 no. weights area and associated access hallways on both ground floor and upper levels will be demolished<br>• The western plant room and its associated plant will be relocated<br>• Construction and reconfiguration of the internal and external walls, roof, windows and door locations |
| 15.6 | C | During the construction of the River Corrib Bridge, alternative access ~~to that along the bank of the River Corrib will be provided~~ across the construction area at the UoG Sporting Campus will be maintained at all times. |
| 15.7 | C | The works to provide replacement stables at Galway Racecourse, are the subject matter of a separate planning application lodged by Galway Race Committee Trust to Galway City Council Reference and for which a decision to grant has issued from Galway City Council on 2 December 2024, but these works from part of the Project for EIA and AA purposes. These works are designed to mitigate against any disruption to the normal operation of Galway Racecourse during the construction of the proposed N6 GCRR. As previously stated, temporary stables also the subject matter of the above mentioned planning application to Galway City Council, will be provided at Galway Racecourse and will be available during the construction of the proposed N6 GCRR until such time as the Galway Racecourse tunnel is complete and the proposed N6 GCRR is operational. The permanent stables will then be built upon completion of construction of the proposed N6 GCRR. |
| 15.8 | C | Mitigation measures as detailed in individual accommodation works agreements, such as boundary treatment, domestic entrances, property condition surveys (as outlined below for Noise and Vibration), provision of ducting to facilitate services, maintenance of access during construction amongst other items will remove impacts related to the properties with partial landtake. |

| Ref. No. | Stage | Commitments |
|---|---|---|
| 15.9 | C | Where the infrastructure for service providers is impacted, this will be diverted or reinstated in accordance with service providers' requirements prior to construction. Service users will be notified in advance of any temporary disruption or outages necessitated by the construction works. The disruption to services or outages will be carefully planned so the duration is minimised. |
| 15.10 | C | Public water supply and foul water systems affected will be reconnected. All necessary diversions will be carried out in accordance with the local authority and Irish Water's requirements. Where private potable water supplies are impacted, a new well or alternative water supply or financial compensation for the loss of the well will be provided. |
| 15.11 | O | The mitigation strategy at the UoG Sporting Campus has been amended to reflect the following:<br>• The southern existing grass-based GAA pitch immediately adjacent to River Corrib is no longer required for the mitigation strategy in UoG<br>• The northern existing grass-based GAA pitch immediately adjacent to River Corrib, which is being temporarily acquired by Galway County Council will be reinstated as a grass training area, with appropriate sand base and drainage in line with its current use post construction and returned to UoG<br>• To ensure interconnection for UoG post completion of the construction, GCC will be providing a right of way for UoG to use the lands under the proposed viaduct for sporting/athletic purposes by way of a long lease. |
| 15.13 | CO | Galway County Council will notify Ob_521_O_517.14_02 of any upcoming day or night time closures near their property. |
| 15.14 | C | The existing decorative historic gates at the entrance to the Aughnacurra Estate will be removed, stored and erected at the front entrance upon completion, noting that they currently do not close and that they will not close and span the new entrance width. |
| 15.15 | C | The existing signage at property 668 on the N83 Tuam Road will be removed, stored and erected at the property upon completion |
| 15.16 | C | The residual lands at property 539 and 540 will be sloped from the rear of the retained existing estate wall up to the embankment of the Project. |
| 15.17 | C | The modifications to the Sports Pavilion at UoG Sporting Campus will be undertaken as enabling works during the summer period prior to commencement of the construction of the proposed N6 GCRR. |
| 15.18 | C | Welfare facilities at the Sports Pavilion at UoG Sporting Campus will be maintained throughout the construction works. |
| 15.19 | C | There will be no parking permitted at the UoG Sporting Campus carpark for the personnel employed for the construction works. |
| 15.20 | C | Additional commitments given to landowners in respect of accesses and boundary treatments are detailed on Figures 5.5.01 to 5.5.30 included in Volume 3 of this updated EIAR. ~~including those set out in the Statement of Evidence of Ms. McCarthy all of which are depicted in the amended drawings entitled "Amended Appendix A.9.1 Landowner Accommodation Works Details_I2" appended hereto and the amended drawings entitled "Amended Appendix A.1.9 Boundary Treatment_I2" appended hereto, which replaces those drawings in Appendix A.9.1 and A.1.9 that were attached to the Request for Further Information (RFI) Response.~~ |
| 15.21 | C | "Table 9.3: Private Access Roads (updated Table 5.15 ~~15~~.~~5~~ of the EIAR)" that was included in the Request for Further Information Response has been updated with additional commitments given to landowners in respect of private access roads. Table 5.15 of this updated EIAR reflects the most up to date access road details. ~~including those set out in the Statement of Evidence of Ms. McCarthy, and Updated Table 9.3 is included hereto as Appendix A.21.7 of this Schedule of Commitments. The updates are included in red in this table~~. |
| 15.22 | C | Plot 207 – Construction of a new boundary wall for along the existing Aille Road (L5384) for the full extent of the property with the height being that of the existing boundary wall. |

| Ref. No. | Stage | Commitments |
|---|---|---|
| 15.23 | C | Plot 607 – Construction of a new stone faced boundary wall at the front of the property along the existing N84 to a height of 1.8m, piers to the entrance, the inclusion of noise reflective gates and regrading of driveway. |
| 15.24 | C | Plot 666 – Construction of a new domestic entrance at the front of the property along the existing N83 on a like for like basis set back 5m from the edge of the carriageway. |
| 15.25 | C | An additional field entrance gate will be provided from AR4/05 to service the farm yard in plot 216. |
| 15.26 | C | The new stone boundary wall for plot 125 will be 1.5m in height. |
| 15.27 | C | The new stone boundary wall for plot 493 will match the height of the existing front boundary wall. |
| 15.28 | C | The new stone boundary wall for plot 523 will match existing wall along Circular Road and will be 2.0m high along access road AR08/02. |
| 15.29 | C | The existing boundary and accessway for plot 131 on the Foraí Maola Road will be removed and a new stonework wall 1.5m high above ground level in accordance with standard detail GCRR-SK-C0-001 will be constructed.<br>To the northern boundary of the property the stonework wall will extend to 2.0m high above ground level. A new 4.0m wide access will be constructed to the north of the property from the Na Foraí Maola to Troscaigh Link Road South. This access will be constructed in accordance with standard details CC-SCD-02753. The new access road will include a new field access to CC-SCD-02754 and single field gate to CC-SCD-00309. |
| 15.30 | C | A stone faced retaining wall will be constructed with a timber post and rail fence located on top as detailed in GCRR-SK-C-004 along the boundary of the display area of plot 668 adjacent to the N83 Tuam Road. A 1.2m high stonework wall will be provided along the remaining extent of the N83 Tuam Road, i.e. from the southern edge of the display area. The remaining proposed boundary treatment for the lands comprise of timber post and rail fencing, constructed in accordance with TII Standard Detail CC-SCD-00301, to the south of the plot and Paladin security fencing surrounding the proposed treatment ponds. |
| 15.31 | C | Access to the residual lands on plot 729, adjacent to the City East Business Park Junction, will be provided via access road AR 15/05. A single field access as per TII Standard Detail CC-SCD-02754 with a Paladin security gate will be provided. |
| 15.32 | C | Signage will be erected at property 668 during construction to ensure that the entrance location is prominent and easily identifiable. |
| 15.33 | C | New signage for the business at property 668 will be erected post construction, replacing the existing signage. |
| 15.34 | C | A single field access gate will be provided for access road AR4/05. |
| 15.35 | C | The stonewall along the boundary of plot 521 adjacent to access road AR 08/01 will be 2.0m high. |
| 15.36 | O | Access road AR 07/07 to be gated and locked with a key provided for property owners 486 and 272_462. |
| 15.37 | C | Where part of a property or land surrounding a property is to be acquired, appropriate accesses have been designed and appropriate boundary treatment will be constructed. |

## 23.5 Material Assets – Agriculture

| Ref. No. | Stage | Commitments |
|---|---|---|
| 14.1 | C | The landowner will be provided with access to all separated land parcels during the construction of the Project. Where temporary disruptions to this access occur landowners will be notified in advance. |
| 14.2 | C | Where existing water and electricity supplies are disrupted during the construction phase an alternative water source or electricity supply will be made available e.g. water tanker or electric cable ducting. If access to surface drinking water sources are permanently restricted alternative groundwater supplies will be provided (or compensation to allow farmer drill his own well). |
| 14.3 | C | Suitable boundary fencing will be erected to delineate the line of the proposed development boundary and prevent disturbance to adjacent land. |
| 14.4 | C | A key contact person will be appointed during the construction phase to facilitate communications between affected landowners and to facilitate the re-organisation of farm enterprises by farmers during critical times. |
| 14.5 | C | Landowners with lands adjoining sites where either rock breaking, blasting or piling takes place will be notified in advance of these activities. |
| 14.6 | C | The impacts on water quality will be minimised by way of a programme of environmental commitments for surface and ground water sources as described in Hydrogeology and Hydrology sections. |
| 14.7 | C | The spread of dust onto adjoining lands will be minimised by way of environmental commitments set out in the air section. Typically, the impact of dust on agricultural grazing livestock is not significant. |
| 14.8 | C | Where drainage outfalls are temporarily altered or land drains blocked or damaged an adequate drainage outfall will be maintained and land drains will be repaired. |
| 14.9 | O | All separated land parcels will be accessible either via the local road network, via accommodation access roads and access tracks. |
| 14.10 | O | Where existing water and electricity supplies to fields or farm yards are severed, the supply will be reinstated by provision of ducting where possible. Alternatively, where ducting is not feasible a permanent alternative water source or electricity supply will be made available. Compensation payments will enable farmers to replace power and water supplies. |
| 14.11 | C/O | Water from the Project will be diverted to attenuation ponds before discharging to watercourses or to ground. The drainage design of the Project will intersect existing field drains and carry the drainage water to suitable outfalls. Drains and drainage outfalls within the proposed fenceline for the proposed N6 GCRR will be maintained by the local authority during the operation phase. |
| 14.12 | O | Landscaping along the Project will minimise the visual impact on farms along the route of the Project and will over time improve shelter in affected farms. |
| 14.13 | C | Galway County Council will employ an equine expert or veterinary practitioner for the duration of the construction contract. |
| 14.14 | C | The design and construction of the temporary stables and permanent stables proposed for Galway Racecourse will be carried out in consultation with the Irish Horseracing Regulatory Board (Horse Racing Ireland HRI). ~~The British Horse Racing Association guidelines will be used as a benchmark in the design in the absence of any future specific HRI guidelines.~~ |
| 14.15 | C | Galway County Council will continue to liaise with Galway Race Committee in relation to the implementation of any approval granted in so far as it relates to Galway Racecourse. |
| 14.16 | C | Provide cattle pen to replace existing cattle pen at plot 571. |
| 14.17 | O | Boundary fencing along the mainline of the proposed N6 GCRR will be maintained by the local authority |

## 23.6 Air Quality

| Ref. No. | Stage | Commitments |
|---|---|---|
| 16.1 | C | The mitigation measures below will be implemented for the construction phase of the Project, in order to reduce the dust risk associated with demolition, construction, earthworks and track-out, in accordance with IAQM guidance by the appointed contractor in accordance with the CEMP in Appendix A.7.5 of this updated EIAR. |
| 16.2 | C | Measures Specific to all Sites: Communications<br>• Development and implement a stakeholder communications plan that includes community engagement before work commences on site<br>• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager<br>Display the head or regional office contact information |
| 16.3 | C | Site Management<br>• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken<br>• Make the complaints log available to the local authority when asked<br>• Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book<br>• Hold regular liaison meetings with other high risk construction sites within 500m of the Project Assessment Boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes |
| 16.4 | C | Monitoring<br>• Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This will include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of Project Assessment Boundary, with cleaning to be provided if necessary<br>• Particulate monitoring (PM10 and PM2.5) will be carried out at the nearest sensitive receptors upwind and downwind of the construction works where sensitive receptors have been identified within 25m of the works. This monitoring programme will take place when works likely to generate dust are being carried out. The monitoring will allow direct comparison with the PM10 and PM2.5 air quality standards on a daily basis<br>• Dust deposition monitoring will be conducted at a number of locations in the vicinity of the Project. At a minimum, monitoring will be carried out at the two nearest ecological receptors at locations where works are occurring within 250m. Monitoring will specifically take place at Castlegar nursing home while works are being undertaken within 250m of the site boundary of the home as agreed at the oral hearing. Monitoring will be carried out using the Bergerhoff method, i.e. analysis of dust collecting jars left on-site (German Standard VDI 2119, 1972). Results will be compared to the TA Luft guidelines. At least one month of dust deposition monitoring will be carried out in advance of the commencement of works to determine a baseline<br>• Carry out regular site inspections, record inspection results, and make an inspection log available to the local authority when asked<br>• Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions |

| Ref. No. | Stage | Commitments |
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| 16.5 | C | Preparing and Maintaining the Site<br>• Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible<br>• Solid dust screens will be implemented at locations where sensitive receptors are located within 100m of the works. In addition, a 2m dust screen will be provided at the locations at the locations in the areas of the overlap of the proposed N6 GCRR and the Lough Corrib cSAC<br>• Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extended period<br>• Avoid site runoff of water or mud<br>• Keep site fencing, barriers and scaffolding clean using wet methods<br>• Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below<br>• Cover, seed or fence stockpiles to prevent wind whipping |
| 16.6 | C | Operating Vehicle/Machinery and Sustainable Travel<br>• Ensure all vehicles switch off engines when stationary - no idling vehicles<br>• Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable<br>• Impose and signpost a maximum-speed-limit of 20km/h on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate) |
| 16.7 | C | Operations<br>• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems<br>• Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate<br>• Use enclosed chutes and conveyors and covered skips<br>• Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate<br>• Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods |
| 16.8 | C | Measures specific to demolition<br>• Ensure effective water suppression is used during demolition operations<br>• Bag and remove any biological debris or damp down such material before demolition |
| 16.9 | C | Measures specific to earthworks<br>• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable<br>• Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable<br>• Only remove the cover in small areas during work and not all at once |
| 16.10 | C | Measures specific to construction<br>• Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place<br>• Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery |

| Ref. No. | Stage | Commitments |
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| 16.11 | C | Measures specific to trackout<br>• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use<br>• Avoid dry sweeping of large areas<br>• Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport<br>• Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable<br>• Record all inspections of haul routes and any subsequent action in a site log book<br>• Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned<br>• Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable)<br>• Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits<br>• Access gates to be located at least 10m from receptors where possible |

## 23.7 Climate

| Ref No. | Stage | Commitments |
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| 17.1 | C | The following environmental commitments will be implemented during the construction phase of the development so as to minimise $CO_2$ emissions:<br>• The substitution of concrete containing Portland cement with concrete containing ground granulated blast furnace slag (GGBS). This measure has led to an estimated saving of c.1,034 tonnes of CO2eq in the current design (50% of cement as GGBS) of the Project<br>• The use of steel which comprises of a minimum of 70% recycled steel<br>• The Project will minimise wastage of materials due to poor timing or over ordering on site thus helping to minimise the embodied carbon footprint of the Project, refer to Chapter 20 Waste and Resource Management<br>• Where practicable, opportunities for materials reuse will be incorporated within the extent of the Project including the use of reclaimed asphalt and recycled aggregate<br>• Where practicable, materials will be sourced locally to reduce the embodied emissions associated with transport |
| 17.2 | C | The Contractor will be required to implement an Energy Management System for the duration of the works. This will include the following at a minimum:<br>• Use of thermostatic controls on all heating systems in site buildings<br>• The use of insulated temporary building structures<br>• The use of low energy equipment and power saving functions on all computer systems<br>• The use of low flow tap fittings and showers<br>• The use of solar/thermal power to heat water for the on-site welfare facilities including sinks and showers |
| 17.3 | C | In addition, in June 2024, the Government of Ireland produced procurement guidance to public bodies to promote the reduction of embodied carbon in publicly supported construction projects and construction materials[2]. These measures include the following which must be adhered to during the procurement process of the Project:<br>• Concrete products including poured or pre-cast products, should in general specify a minimum of 30% clinker replacement, consistent with IS EN 206, except where a technical justification is made by a suitably qualified professional to the satisfaction of the procurer.<br>• High-carbon CEM I cement products should not be procured by public bodies, or used in publicly produced construction projects, except where a technical justification is made by a suitably qualified professional to the satisfaction of the procurer.<br>• Public bodies should seek an Environmental Product Declaration, to an EN 15804 standard, or equivalent when directly procuring cement or concrete products. Confirmation of a similar |

[2] Procurement guidance for public bodies: Reducing embodied carbon in construction - DETE (enterprise.gov.ie)

| Ref No. | Stage | Commitments |
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| | | disclosure should be sought by public bodies, where a contracted party is managing materials procurement. When available, public bodies should require a Declaration of Performance and Compliance under the Construction Product Regulation.<br>• Public bodies procuring infrastructure projects (construction other than buildings) in receipt of exchequer funding in excess of €60 million, should produce or procure a Whole Life-Cycle Greenhouse Gas Emissions assessment for their project. Public bodies should identify the most appropriate, available methodology to ensure that the project's embodied carbon is suitably interrogated, and applicable to the infrastructure or project-type. |
| 17.4 | C | Implementation of the Construction Traffic Management Plan (CTMP) is included in Appendix A.7.5. |

## 23.8 Noise and Vibration

| Ref. No. | Stage | Commitments |
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| 18.1 | C | The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001. These measures will ensure that:<br>• No plant used on site will be permitted to cause an ongoing public nuisance due to noise<br>• The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations<br>• All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract<br>• Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers<br>• Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use<br>• Any plant, such as generators or pumps that is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen<br>• During the course of the construction programme, the contractor will be required to manage the works to comply with the limits detailed in Table 18.2, Chapter 18, Noise and Vibration using methods outlined in BS 5228-1 (2009+A1 2014) |
| 18.2 | C | The Contractor will be required to conduct construction noise predictions prior to works taking place and put in place the most appropriate noise control measures depending on the level of noise reduction required at any one location. |
| 18.3 | C | The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether or not said item can be replaced with a quieter alternative. |
| 18.4 | C | For static plant such as compressors and generators used at work areas such as construction compounds etc., the units will be supplied with manufacturers' proprietary acoustic enclosures where possible. |
| 18.5 | C | The Contractor will evaluate the choice of piling, excavation, breaking or other working method taking into account various ground conditions and site constraints. Where possible, where alternative lower noise generating equipment that would economically achieve, in the given ground conditions, equivalent structural/ excavation/ breaking results, these will be selected to minimise potential disturbance. |
| 18.6 | C | If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant, or the application of improved sound reduction methods in consultation with the supplier or the best practice use of equipment and materials handling to reduce noise. In practice, a balance may need to be struck between the use of all available techniques and the resulting costs of doing so. It is therefore proposed to adopt the concept of "Best Available Techniques", as defined in EC Directive 96/61. |
| 18.7 | C | Proposed noise mitigation techniques will also be evaluated in light of their potential effect on occupational health and safety. The following outline guidance relates to practical noise control at source techniques which relate to specific site considerations, which have been reviewed and updated since the 2018 EIAR: |

| Ref. No. | Stage | Commitments |
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| | | • For static plant such as compressors, generators, motors, pumps, the units will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation, as required, to ensure CNTs are not exceeded<br>• Where practicable, equipment powered by mains electricity shall be used in preference to equipment powered by internal combustion engines or locally generated electricity<br>• For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. Mobile plant will be switched off when not in use and not left idling<br>• For piling plant, noise reduction can be achieved by enclosing the driving system in an acoustic shroud. For steady continuous noise, such as that generated by diesel engines, it is possible to reduce the noise emitted by fitting a more effective exhaust silencer system or utilising an acoustic canopy to replace the normal engine cover<br>• For percussive tools such as pneumatic concrete breakers, rock drills and tools a number of noise control measures include fitting muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed. Erection of localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries are other suitable forms of noise reduction<br>• Reverse alarms from mobile plant within large construction compounds (e.g. areas of extensive cutting), will be broadband to reduce tonal elements from this source<br>• Mobile and stationary plant will be switched off or throttled back to a minimum when not in use (engines, motors and generators). Lorries, trucks and concrete vehicles will not be permitted to queue outside site compounds with engines left idling. Construction vehicles in lorry holding areas will be required to switch engines off when stationary<br>• For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum<br>• For all materials handling, the contractor will ensure that best practice site noise control measures are implemented including ensuring that materials are not dropped from excessive heights and drop chutes/dump trucks are lined with resilient materials. This is an important consideration for site compounds where materials are loaded and unloaded. Site compounds in close proximity to noise sensitive areas (refer to Table 18.15) will incorporate a strict noise control policy relating to materials handling<br>• Resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can be controlled by fixing resilient materials in between the surfaces in contact<br>• Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary<br>• All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures |
| 18.8 | C | As per BS 5228 -1:2009+A1 2024 screens on level sites shall be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. Annex B of BS 5228-1:2009+A1:2014 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds. |
| 18.9 | C | The Contractor will carefully plan the site layout. Within site compounds, the placement of site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening. Similarly, in some instances materials such as topsoil or aggregate along the route of the proposed N6 GCRR can provide a degree of noise screening if placed between the source and the receiver. |
| 18.10 | C | Construction activity will mostly take place during daytime hours Monday to Friday and Saturdays (ref Section 18.4.1.5 of Chapter 18 of this updated EIAR). Depending on the noise emission levels experienced and associated noise impact, the Contractor will be flexible and able to conduct certain works at hours which reflect periods when the neighbouring properties have lower sensitivities to noise. |
| 18.11 | C | It will be necessary to work overtime (including weekends) and night shifts at certain critical stages during the project. Over the expected 36-month construction phase there will be up to 10 weeks of night time working along different sections of the proposed N6 GCRR primarily to facilitate bridge works over existing roads. |
| 18.12 | C | Consideration will be given to the scheduling of activities in a manner that reflects the location of the site and the nature of neighbouring properties. Each potentially noisy event/activity will be considered on its individual merits and scheduled according to its noise level, proximity to sensitive locations and possible options for noise control. In situations where a particularly noisy activity is scheduled e.g. |

| Ref. No. | Stage | Commitments |
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| | | activities identified in Table 18.14 of Chapter 18 of this updated EIAR (rock breaking/crushing/impact piling etc.) or other activities of similar noise level, the use of other on-site activities will be scheduled to control cumulative noise levels. |
| 18.13 | C | A designated noise liaison officer will be appointed to site during construction works to establish a clear form of communication between the Contractor and residents or building occupants in noise sensitive areas. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer. |
| 18.14 | C | During the construction phase noise monitoring will be undertaken at the nearest sensitive locations to ensure construction noise limits outlined in Table 18.2 of Chapter 18 of this updated EIAR are not exceeded. Noise monitoring will be conducted in accordance with the International Standard ISO 1996: Acoustics – Description, measurement and assessment of environmental noise Part 1 (2016) and Part 2 (2017). The selection of monitoring locations will be based on the nearest sensitive buildings to the working area which will progress along the length of the road construction. It is recommended that noise control audits are conducted at regular intervals throughout the construction programme in conjunction with noise monitoring. |
| 18.15 | C | In terms of blast design control, specific guidance will be obtained from the recommendations contained within BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration in relation to blasting operations in addition to experienced blast control techniques used by the Contractor. These will include some or all of the following:<br>• All blasting will be undertaken by professionally trained blast contractors.<br>• Restriction of hours within which blasting can be conducted (09:00 –18:00hrs).<br>• Trial blasts will be tested in less sensitive areas to assist in blast designs and identify potential zones of influence.<br>• Explosive charges will be properly confined by a sufficient amount of stemming.<br>• Blasting contractors will ensure that the minimum amount of primer cord is used, and that no primer cord is located above ground.<br>• Profiling will be carried out after each blast in order to ensure the geometry of the rock face can be established, enabling the optimum burden and spacing to be applied for subsequent blasts.<br>• The design, execution and completion of any blasting within 150 metres of any existing structure shall require special considerations. This will include the use of pre and post condition structural surveys by a competent structural engineer.<br>• Ground vibration and air over pressure (AOP) will be recorded simultaneously for each blast at the most sensitive locations, depending on the works area being blasted.<br>• When blasting moves into a new area, an initial low level blast will be carried out (i.e. a low Maximum Instantaneous Charge (MIC)) and monitoring will be carried out simultaneously at a number of sensitive properties in different directions in order to generate specific scaled distance graphs.<br>• The scaled distance graphs will be used to determine the optimum MIC for subsequent blasts area in order control vibration and AOP limits below the relevant limit values (as set out in Section 17.2.1) at the nearest sensitive buildings. |
| 18.16 | C | In line with best practice mitigation measures from vibration sources, good communication and public relations are a key factor in reducing any startle effects to residents. In this instance, a Public Communications Strategy will be implemented by the Contractor prior to the commencement of any blast works. In such cases, the following recommended environmental commitments are proposed:<br>• Relevant nearby residents will be notified before any work and blasting starts (e.g. a minimum of 24-hour written notification).<br>• The firing of blasts will be undertaken, where possible, at similar times to reduce the 'startle' effect.<br>• Ongoing circulars will be issued informing people of the progress of the blasting works.<br>• The implementation of an onsite documented complaints procedure will be maintained by the Contractor.<br>• The use of independent monitoring will be undertaken by external bodies for verification of results. |
| 18.17 | C | Vibration from construction activities should be limited to the values set out in Table 18.4 of Chapter 18 of this updated EIAR. |
| 18.18 | C | In the case of vibration levels giving rise to human discomfort, in order to minimise such impacts, the following measures shall be implemented during the construction period:<br>• A clear communication programme will be established to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to exceed |

| Ref. No. | Stage | Commitments |
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| | | perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars.<br>• Alternative less intensive working methods and/or plant items shall be employed, where feasible.<br>• Appropriate vibration isolation shall be applied to plant, where feasible.<br>• Cut off trenches to isolate the vibration transmission path shall be installed where required.<br>• In the case of impact piling or demolition works for instance, a reduction in the input energy per blow shall be considered where required.<br>• Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values. |
| 18.19 | C | Property condition surveys will be offered for all buildings within 50m of the Assessment Boundary and those within 150m of proposed blasting works across the Project.<br>Property condition surveys will also be carried out at buildings and structures considered appropriate relative to their proximity to the works. Such property condition surveys shall be carried out by a Chartered Surveyor or Chartered Structural Engineer. Such property condition surveys, subject to the written agreement of relevant property owners, shall be carried out in two stages as the follows:<br>• the first stage shall consist of pre-construction condition surveys including photographic records which shall be carried out prior to the commencement of construction.<br>• the second stage shall consist of post-construction condition surveys which shall include photographic records. |
| 18.20 | C | The location of potentially vibration sensitive activities have been identified for manufacturing facilities within the Parkmore and Racecourse Business Parks. This location is in proximity to an area where blasting will take place as part of the proposed tunnel at Ballybrit (Galway Racecourse Tunnel). The most effective form of mitigation for this type of sensitive process is through on-going consultation with the property owners as the design and construction of the Project progresses. This will involve baseline vibration monitoring and the use of trial blasts using an initial low level charge with simultaneously vibration measurements undertaken at the building. This information will be used to determine acceptable vibration levels for the facility relating to the sensitivity of the operating equipment. The results of this trial assessment will then set appropriate agreed limits values at the facility in question which will be monitored during subsequent blasts or other excavation methodologies. Where no safe limit is determined, the timing and scheduling of blasts will be undertaken in consultation with the facility when no sensitive operations are taking place. Given the short time period over which an individual blast takes place (i.e. a number of seconds), this approach is deemed to be feasible.<br>M&M Qualtech will be included in the list of property owners to be consulted with as the design and construction of the Project progresses, in particular in respect of the dates of rock breaking and blasting and the detailed traffic management plan for their area. Vibration monitoring will be undertaken at their property in Parkmore. |
| 18.21 | O | Low Noise Road Surface (LNRS) will be used to reduce noise generated at source. |
| 18.22 | O | Noise barriers as detailed in Table 18.24 in Chapter 18 of this updated EIAR and Figures 18.1.01 to 18.1.15 will be implemented to reduce noise levels along the propagation path between the source (proposed N6 GCRR) and the specific receivers (houses, schools, churches etc.). These screens may be constructed as earth bunds, proprietary noise barriers or a combination of both. |
| ~~18.23~~ | ~~O~~ | ~~Noise barrier NB12/05 will be extended west to Chainage 12+550 to reduce noise levels at assessment location R188 below the TII design goal taking account of the RFI sensitivity analysis.~~ |
| 18.24 | C | The residents in the Menlo-Coolough-Ballinfoile-Ballindooley area will be informed of any proposed blasting in advance of blasting been undertaken, as set out in Section 13.1 of the CEMP in Appendix A.7.5 of this updated EIAR and Appendix C of the updated NIS. |
| 18.25 | C | A property condition survey will be carried out at the thatched cottage in Coolough Village, Menlough and at M&M Qualtech, Parkmore Business Park. |
| 18.26 | C | The Contractor shall liaise with the operator for Twomileditch Quarry in relation to the blasting schedule for the proposed N6 GCRR and the blasting schedule for the quarry. The Contractor shall ensure that blasting between the School Road and N84 does not take place at the same time (concurrently) as blasting in Twomileditch Quarry. |
| 18.27 | O | In addition to the physical barriers proposed, it is recommended that the following sections of road, outside of the Assessment Boundary are surfaced with a LNRS to reduce potential significant impacts in the opening and design years:<br>• Ballymoneen Road: South of the proposed N6 GCRR to Western Distributor Road Junction<br>• Ballymoneen Road: North of the proposed N6 GCRR to Rahoon Road Junction |

| Ref. No. | Stage | Commitments |
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| | | • Letteragh Road / Circular Road: South of the proposed N6 GCRR to Seamus Quirke Road |

## 23.9 Landscape and Visual

| Ref. No. | Stage | Commitments |
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| 12.1 | C | Landscape mitigation proposals shall take account of the approaches and principles as set out in A Guide to Landscape Treatments for National Road Schemes in Ireland, in particular to Chapter 4: Components of the Roadside Landscape; Chapter 5: Soil Geographic Factors; and Chapter 6: Landscape Treatments. Unless otherwise qualified in the following or in Chapter 8, Biodiversity, seeding and planting proposals, including species and planting type and species shall be in accordance with Chapter 6 of the Landscape Guidelines (A Guide to Landscape Treatments for National Road Schemes in Ireland) adapted as required for local environmental and landscape conditions. |
| 12.2 | C | Site machinery shall operate within the Project construction area. |
| 12.3 | C | Storage areas shall be located so as to avoid impacting further on existing residential and other property, woodlands, trees, hedgerows, drainage patterns, etc. |
| 12.4 | C | Solid site hoarding of minimum 2.0m in height shall be provided alongside construction works adjoining residential property or recreational amenities |
| 12.5 | C | Solid hoarding or similar, of minimum 2.0m in height shall be provided along any side of a proposed construction compound, where they are located within 100m of residential properties. |
| 12.6 | C | Construction compounds shall be fully-decommissioned and reinstated to their pre-construction condition at the end of the construction contract unless these areas have been identified as habitat compensation or material deposition areas. |
| 12.7 | C | Side slopes and other landscape areas along the proposed N6 GCRR shall be prepared for soiling, and either seeded and/or planted at the earliest possible opportunity. As such, some scope may exist for undertaking significant areas of seeding and planting prior to the end of the construction works. However, due to construction programming and seasonal restrictions, it is also likely that significant planting works will not be undertaken until the end of the major construction phase in Phase 2 of the Project. |
| 12.8 | C | All mitigation planting will take place at the earliest opportunity feasible during the construction stage so as to maximise establishment prior to the proposed N6 GCRR opening. |
| **Project Wide Measures** | | |
| 12.9 | O | Cut slopes on mainline, link roads and local roads:<br>Cut slopes shall be finished to even gradients, topsoiled unless otherwise stated in this table or elsewhere in this updated EIAR. Slopes shall be free of rubble and stones over 50mm diameter. All such rubble/stone shall be removed or buried. Unless otherwise stated slopes shall be seeded to a low maintenance non-agricultural grassland or to a diverse grass/wildflower sward, as appropriate. Steep slopes may be hydro-seeded.<br>Where exposed, stable rock cuttings/slopes will be retained as a landscape feature along the proposed road corridor. |
| 12.10 | O | Embankments on mainline, link roads, and local roads:<br>Embankments shall be finished to even gradients, topsoiled unless otherwise stated in this table or elsewhere in this updated EIAR. Slopes shall be free of rubble and stones over 50mm diameter. All such rubble / stone shall be removed or buried. Unless otherwise stated slopes shall be seeded to a low maintenance non-agricultural grassland or to a diverse grass / wildflower sward, as appropriate. Steep slopes may be hydro-seeded. |
| 12.11 | O | Verges & Roundabouts on mainline, link roads, and local roads:<br>Verges will be provided along both sides of the mainline of the proposed N6 GCRR. Verges will also be provided around junctions and along local road re-alignments and tie-ins. Verges and roundabouts shall be finished to even or gently flowing gradients, with minimum 200mm topsoil. Areas shall be stone buried or raked will be free of rubble and stones over 25mm diameter. Verges and roundabouts will be seeded to low-maintenance seed mix. |
| 12.12 | O | Ponds, swales, 'V-drains' etc.: |

| Ref. No. | Stage | Commitments |
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| | | All slopes shall be evenly graded and free of rubble and stones over 50mm diameter. Slopes shall be seeded to low maintenance non-agricultural grassland or to a grass/wildflower sward, allowing for natural development over time. Steep slopes on pond edges and 'V-drains' may be hydro-seeded.<br>Areas around ponds shall be a diverse landscape of low maintenance grassland / species-rich grass wildflower sward and plantings of scrub planting and / or low-canopy woodland and shrub planting. Hedgerows of blackthorn and hawthorn, hazel and holly, without tree species, shall be established along non-roadside boundaries.<br>Non-palisade type fencing (e.g. paladin or timber and anti-climb netwire fencing) shall be used to secure pond areas.<br>The overall objective of the landscape treatment around pond features is to provide a sustainable, low maintenance and ecologically diverse landscape of grassland and mixed planting with new hedgerows along secured boundaries. The ponds have the potential to add to local landscape, visual and ecological diversity. |
| 12.13 | O | Noise barriers/bunds:<br>Where possible hedgerow scrub and shrub planting and / or low-canopy woodland of native species shall be established as either a narrow planting of 3.0m minimum width or double-staggered hedgerow along the full off-road face of barriers.<br>Low-canopy and / or shrub planting of native species shall be established on the off road face of bunds. The planting shall include ash*, birch, blackthorn, elder, hawthorn, hazel, holly, rowan and / or willow species as appropriate. Plants shall be 90 to 120cm in height at planting.<br>* Note: Due to the risk of Ash Dieback (Chalara fraxinea) and until further notice, ash (Fraxinus species) is no longer approved by the TII for planting schemes. This does not impact on the use of Mountain ash – also known as rowan (Sorbus aucuparia).<br>Transparent noise barriers will be used on the River Corrib Bridge. |
| 12.14 | 0 | Plants and planting areas:<br>All tree species over 150cm in height together with all Pine shall be appropriately staked and tied. All failed, dead or defective plants shall be replaced before the end of each and every year of defect aftercare.<br>Full planting area will be free of stones over 50mm in diameter. |
| 12.15 | O | Grass areas:<br>Grass areas shall provide full sward cover within 12 months of seeding. Any failed, bare or defective areas shall be re-seeded between March – May and / or August – September in each and every year of defect aftercare. |
| 12.16 | O | Unauthorised access, parking and/or encampment:<br>Landscape proposals shall avoid creating areas considered as being suitable for unauthorised parking and shall use landscape proposals to deter and prevent such use. |
| 12.17 | O | Remnant areas:<br>Any post-construction remnant lands shall be treated to a diverse range of grassland and / or planting proposals to include a minimum 30% planting, amended as locally appropriate. The remaining area shall be treated as locally appropriate low maintenance grass / species-rich sward. |
| 12.46 | C/O | Stone Walls<br>Where stone walls are removed and not replaced as part of the Project, the stone will be retained and made available for re-use by the adjacent property owners for the construction of a new stone wall their side of the Project boundary if they wish.<br>The removal of sections of old stone walls is a significant impact along sections of the proposed N6 GCRR. Many of these are low, dilapidated and interwoven with vegetation. As such, it would not be possible to replace walls of the same character and such features would not provide for an adequate boundary to the proposed N6 GCRR.<br>Provision of new a stone boundary along the mainline would create its own visual issues, due to what would be a homogenous and incongruous landscape feature in contrast with the existing dry stone walls in the area.<br>Therefore, the provision of timber post-and-rail fences and substantial landscaping planting – with selective replacement of stone or render boundary walls to affected houses is considered preferable. |
| 12.47 | O | Road Lighting<br>Proposed road lighting has been designed to limit light trespass and measures include: |

| Ref. No. | Stage | Commitments |
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| | | • The use of modern LED fittings with well-defined, controlled light beam distribution<br>• The use of horizontal, lighting cut-off fittings, which prevents light emission to the sky and minimises light direction off the proposed N6 GCRR. |
| 12.48 | C/O | Construction Compounds<br>At the end of the construction contract construction compounds will be decommissioned, cleared and the lands reinstated or landscaped. |
| 12.18 | O | Where feasible landscape measures shall include for the re-connection of existing field boundaries and hedgerows along the Project. Where appropriate trees species as noted in Mitigation Tables 12.7 and 12.8 of this updated EIAR, shall be randomly spaced in a visually naturalistic manner within such hedgerows. |
| 12.19 | O | Where areas are in cut or fill, a grass or meadow sward will be established over the slope except in areas of cutting through stable rock (see Landscape Guidelines, Section 4.2: Cuttings and Embankments). Except where otherwise required, it is not proposed to plant either cut or fill slopes in their entirety, but to encourage a more naturalistic and locally sympathetic grouping of plantings within a semi-natural grass sward. Slopes may also be seeded to wildflower grassland and hydro-seeding may be utilised for seeding of steep slopes. It is expected that significant extent of rock cutting will arise on the Project. Stable rock slopes will be retained as an exposed face for natural colonisation and as a local landscape features. |
| 12.20 | O | Along the length of the Project, landscape areas within junctions and small areas of severed fields, plots or other property acquired for the construction of the Project will be varyingly treated including being planted in a semi-natural copse like scrub plantings and native woodland species. (see Landscape Guidelines, Section 4.6: Additional Plots and Other Areas). Such planted blocks dispersed along the Project will assist in the improvement of the longer-term visual character of the Project and local surrounds. Particular attention shall be given to an appropriate extent and scale of planting in and surrounding junctions (see Landscape Guidelines, Section 4.3: Junctions, Interchanges and Roundabouts) and embankments (see Landscape Guidelines, Section 4.2.2: Embankments). |
| 12.21 | O | Certain areas along the length of the Project have been set aside for drainage requirements/pollution control/attenuation. Where proposed these will be securely fenced and planted with locally appropriate hedgerows, shrubs and/or screen planting located along the proposed development boundary to minimise any visual impact from off road areas. However, it is noted that these features also offer the potential to provide for improved landscape diversity and habitat. |
| 12.22 | O | Proposed planting will generally be established using bare-root transplants, whips and feathered plants which adapt readily to disturbed ground conditions.<br>A proportion, totalling not less than 5% of 'Half-standard' (6-8cm girth & 200cm-250cm tall) and a further 5% 'Standard' (8-10cm girth & 250cm-300cm tall) trees shall be used to supplement these plantings, especially in the vicinity of residential areas. All planting mixes will take cognisance of, and include native and local species as identified in the Chapter 8, Biodiversity. These requirements have been adapted and further detailed as appropriate to particular areas as set out in Table 12.8 of Chapter 12, Landscape and Visual of this updated EIAR. |
| 12.23 | O | Where used, tree species will be selected from a list of primarily native, naturalised and indigenous species, which will include alder, common ash (subject to planting restrictions at time of works), common birches, common oaks, mountain ash, Scots pine and willow species. Planting sizes will be from 75cm to 400cm in height and tree species will be planted at average 2.0m centres within the wider planting mix. |
| 12.24 | O | Shrub planting species utilised will be selected from a list of primarily native and indigenous species, which will include, blackthorn, elder, hawthorn, hazel, holly, guelder rose, spindle, willows and other plants found naturalised in the affected localities. Planting sizes will vary from 30 to 75cm in height and shrub species will be planted at between 1.0 and 1.5m centres depending of landscape type, see Table 12.8 of this updated EIAR. |
| 12.25 | O | Hedge planting will be primarily of blackthorn and hawthorn interspersed with other species such as elder, hazel, holly and those found locally. Hawthorn within hedgerows shall be planted at between 75 to 90cm in height and at 500mm centres in each of 2 double staggered rows or wider plantings where a denser effect is required. The hedgerow will be interspersed with standard-sized randomly spaced tree species such as alder, common ash and oaks, as appropriate to particular locality. |
| 12.26 | O | Areas to be seeded to meadow will be thinly topsoiled (5cm layer) and seeded with a locally appropriate seed mix. Mainline and side road verges will be cultivated, topsoiled minimum 200mm deep and stone buried to remove stones down to 25mm diameter prior to seeding to a low-maintenance grass seed mix. |
| 12.27 | O | Where lighting is proposed, the lighting design shall meet the requirements of BS EN 13201-2:2003 and BS5489-1: 2003, Code of Practice for Design of Road Lighting. Lighting of Roads and Public |

| Ref. No. | Stage | Commitments |
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| | | Amenity Areas and shall comply with the requirements of the DMRB TD 34-91. The detailed lighting design shall be completed in a manner, which will minimise glare and will ensure that light-spill effect is minimised. |
| **Specific Measures** | | |
| 12.28 | O | In specific locations barriers and/or earth bunds may be provided to reduce the impact of noise. Such features shall, wherever possible, be integrated within the proposed landscaping measures. |
| 12.29 | O | All of the following specific environmental commitments will be taken account of in the detailed design and implementation of landscape measures:<br>• Location of cut-off drains at the top of cuttings and at the bottom of embankments<br>• The location and requirements for maintenance access along the mainline of the proposed N6 GCRR<br>• Locations where rock is encountered in cuttings. Such rock faces may be retained as geological features of the corridor of the proposed N6 GCRR<br>• The location and integration of noise barriers within the landscape design<br>• Clearance zones (TD19 - Safety Barrier Standards)<br>• Sight-lines, including at junctions and to carriageway signage, etc. |
| 12.30 | O | Where feasible reinforced earth retaining wall approaches will be incorporated so as allow for a green landscape finish to all or part of the retaining structures. A limestone finish will be used where structural walls are required and for the abutments of the proposed bridge over the N59 Moycullen Road. The stone will consist of natural limestone, matching the character of the local stone, with a strong horizontal axis of between 5 to 1 and 7 to 1 (i.e. horizontal to vertical dimension). |
| 12.31 | O | Landscape Measures also take account of the specific protection and environmental commitments detailed in Chapter 8, Biodiversity. In particular, the measures include:<br>• Retained habitats, trees and hedgerows on land-take boundaries, etc. will be fenced-off and protected during construction works.<br>• Specific measures are proposed at a number of locations for mitigation of potential impact on Bat species. This includes:<br>– the provision of artificial bat roosts – with specific planting to encourage use<br>– the provision of a planted wildlife overbridge (Ch. 12+700) with tie-in planting to local hedgerows and proposed planting on the boundary of the proposed N6 GCRR, which will maximise potential benefit and use<br>– dense planting, with trees for improvement of connectivity along the boundary of the proposed N6 GCRR:<br>– west of the crossing of the L1323 Letteragh (Ch. 7+200 – Ch. 7+280)<br>– along embankments to either side of the proposed bridge over the River Corrib<br>– between the crossing of the N84 Headford Road at Ballindooley and School Road at Castlegar<br>– hedgerow planting for improvement of connectivity of habitats to the east of Menlo Castle<br>– hedgerow and copse planting for enhancement of foraging habitat to the north of Menlo Castle<br>• In order to deter Barn Owls from foraging close to the Project, embankments and cuttings, other than rock cuttings or cut slopes left to naturally regenerate, will be densely planted with low growing scrub (e.g. blackthorn, hawthorn) from Ch. 8+550 to Ch. 17+500.<br>• In order to deter Barn Owls from over flying the proposed N6 GCRR, planting of closely-spaced trees (approx. 2m centres) greater than 3m in height will be established along the top of the embankments between Ch. 9+600 and Ch. 10+100.<br>• All mitigation planting will take place at the earliest opportunity feasible during the construction stage so as to maximise establishment prior to road opening. |
| 12.32 | O | 6.0m wide Screen Planting (Planting at 1.0m centres for visual screening shall be of a minimum of 6m in width. The planting shall extend for a minimum of 100m to either side of any adjoining residential property or amenity. (refer to Figures 12.1.01 to 12.1.15)).<br>• Planting will include a dense planting at 1m centres of alder, birch, blackthorn, elder, geulder rose, holly, hawthorn, hazel, rowan, and willow species. Shrubs shall be planted at between 60 to 90cm in height.<br>• Scots pine of minimum 60cm in height at planting shall comprise 20% of the overall plant numbers and holly at a minimum of 45cm in height shall comprise a further 15%. |

| Ref. No. | Stage | Commitments |
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| | | • Tree species, planted equally at half-standard (6-8cm girth) and standard size (8-10cm girth), shall comprise minimum 10% of the mix. |
| 12.33 | O | 3.0m wide Screen Planting (Where space is limited planting at 1.0m centres for visual screening shall be of a minimum of 3m in width. The planting shall extend for a minimum of 100m to either side of any adjoining residential property or amenity. (refer to Figures 12.1.01 to 12.1.15)).<br>• Planting will include a dense planting at 1m centres of alder, birch, blackthorn, elder, geulder rose, holly, hawthorn, hazel, rowan, and willow species. Shrubs shall be planted at between 60 to 90cm in height.<br>• Scots pine of minimum 60cm in height at planting shall comprise 20% of the overall plant numbers and holly at a minimum of 45cm in height shall comprise a further 15%.<br>• Tree species, planted equally at half-standard (6-8cm girth) and standard size (8-10cm girth), shall comprise minimum 20% of the mix. |
| 12.34 | O | Stone Wall Boundaries (Stone walls as indicated on Figures 12.1.01 to 12.1.15).<br>• Where indicated, stone walls will be replaced along impacted sections of property and road boundaries on local roads. The stone from the disturbed sections of existing walls will be retained and re-used (generally granite to west; limestone to east) where possible to reinstate these new boundaries. The boundary walls may be backed by hedgerows of locally appropriate species, i.e. blackthorn, hawthorn and holly to west and hazel, hawthorn and holly to east.<br>• Elsewhere, where stone walls are removed the stone will be retained and made available for re-use by the adjacent property owners for the construction of a new stone wall on their side of the fenceline for the proposed N6 GCRR if they wish. |
| 12.35 | O | Boundary Hedgerow (Typical double staggered hedgerow with tree planting, where locally appropriate).<br>• West: Primarily blackthorn (30%), hawthorn (40%) and holly (10%) hedgerow in west interspersed with other species (20%) such as elder, willow, and those found locally.<br>• East: Primarily hazel (30%), hawthorn (40%) and holly (10%) hedgerow to east interspersed with other species (20%) such as blackthorn elder, willow, and those found locally.<br>• Hawthorn plants shall be of c.90cm in height and planted at 50cm centres in each of two double staggered rows, 25cm apart. Other plants of c.50cm in height shall be interspersed.<br>• The hedgerow may be interspersed with 'half-standard-sized' (6-8cm girth) alder, birch and/or oak trees planted at random spacings but averaging a min. of 1 tree per 25 linear metre. Limited tree species, such as birch and mountain ash may also be included as 'whips' at 150cm in height. |
| 12.36 | O | Retaining Walls and structure over the N59 Moycullen Road (Use of reinforced earth retaining systems and limestone finishes for structural elements. Retaining Wall Structures R08/01; R08/02; R08/07 & R08/04; and Bridge Structure S08/02 (Ch. 8+300 to Ch. 8+670 of the proposed N6 GCRR))<br>• Where feasible reinforced earth retaining wall approaches will be incorporated so as allow for a green landscape finish to all or part of the retaining structures.<br>• Planting of trees shall also be provided along the base of the structure. These shall include smaller growing species such as alder, birch and rowan planted as Selected Standards (i.e. 14cm girth or greater).<br>• A limestone finish will be used for the external finish of the abutments for the proposed bridge over the N59 Moycullen Road and where structural walls are required. The stone will consist of natural limestone, matching the character of local stone, with a strong horizontal axis of between 5 to 1 and 7 to 1 (i.e. horizontal to vertical dimension). |
| 12.37 | O | Bat habitat enhancement (new 2m wide tree and shrub hedgerow, with occasional planted copses located north and east of Menlo Castle.)<br>• New hedgerow of native species will be established with plants at 0.5m staggered centres in each of 5 rows located 0.5m apart to sub-divide existing open fields.<br>• Standard-sized trees species (min 8-10cm girth, 2.4m high) will be planted at 15m staggered centres in each of the 3 central rows. Diverse range of shrub species will be planted between trees in the central rows and throughout the outer 2 rows.<br>• Circa 15m diameter woodland copses will be established within open fields using similar approach, densities and species<br>• Planting will be protected by stock-proof fence, c.1.25m high located at 1.0m offset to either side of the outer row of the new hedgerow.<br>• Tree species to include alder, birch, oak, rowan, planted as standards (as above) and whips (1.25m high). Shrubs to comprise mainly blackthorn, hawthorn and hazel (combined 60%), with elder, holly, spindle, willow etc. |

| Ref. No. | Stage | Commitments |
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| | | • Hawthorn plants shall be of between c.90cm in height and all other shrubs shall be c.60cm in height. |
| 12.38 | O | Wildlife Overpass (Ballindooley/Castlegar, Structure S12/02 (Ch. 12+700 of the proposed N6 GCRR))<br>• Wildlife overpass (c.30m wide) will be landscaped to provide for connective habitat across proposed N6 GCRR. Planting to consist of a central narrow grass path bounded on either side by tree-lined hedgerows of native species.<br>• Soil depths to vary from minimum c.45cm depth at edges to c.1.5m depth along centre-line of both hedgerows. Planted element of both hedgerow lines will be c.2m wide with standard-sized trees (min 8-10cm girth, 2.4m high) planted at 3m staggered centres in each of 2 rows in each hedgerow. Diverse range of shrub species will be planted between trees and along the line of each hedgerow.<br>• Planting to tie-in to proposed planting leading east and west on upper slopes of cuttings on both sides of the proposed N6 GCRR. This will form a continuous hedgerow/planted network.<br>• Tree species to include alder, birch, oak, rowan, planted as standards (as above) and whips (1.25m high). Shrubs to comprise mainly blackthorn, hawthorn and hazel (combined 60%), with elder, holly, spindle, willow etc.<br>• Hawthorn plants shall be of between c.90cm in height and all other shrubs shall be c.60cm in height. |
| 12.39 | O | Barn Owl Planting<br>Typical double staggered treeline with dense under planting, between Ch. 9+600 and Ch. 10+100 of the proposed N6 GCRR.<br>• Deterrent tree planting to comprise alder, birch and/or rowan planted at ~~3m~~ 4m in height (min. 12-14cm girth) and at 2.0m centres in each of 2 rows 1.5m apart.<br>• Dense low scrub planting to comprise blackthorn (50%), hawthorn (20%), hazel (10%) and holly (10%) hedgerow in the west interspersed with other species (10%) such as elder, willow, and those found locally.<br>• Hawthorn plants shall be of c.90cm in height and planted at 50cm centres. Blackthorn and other plants shall be of c.50cm in height and planted at 50cm centres in staggered rows, 50cm apart.<br>Dense low scrub planting on all embankments and cut slopes (other than rock cuttings or cut slopes left to naturally regenerate) from Ch. 8+550 to Ch. 17+540 of the proposed N6 GCRR.<br>• Dense low scrub planting to comprise blackthorn (50%), hawthorn (20%) hazel (10%) and holly (10%) interspersed with other species (10%) such as elder, willow, and those found locally.<br>• Hawthorn plants shall be of c.90cm in height and planted at 50cm centres. Blackthorn and other plants shall be of c.50cm in height and planted at 50cm centres in staggered rows, 50cm apart.<br>• Compensatory Habitat Areas (CHA) along the Project will be as detailed in Chapter 8, Biodiversity. |
| 12.40 | O | It is proposed to extend the proposed of 3m wide mixed screen planting belt along the property side of the proposed N6 GCRR west from Ch. 1+760 back to Ch. 1+580 as indicated on Figure 12.1.14 of this updated EIAR, as amended. |
| 12.41 | C | A grass verge with birch tree planting will be established to either side of the new entrance avenue into Aughnacurra Estate to match the character of the existing entrance. |
| 12.42 | C | Except where the existing wall is retained, a new stone wall will be constructed to the front of properties 539 and 540 (west of proposed N6 GCRR) along the side of the existing / realigned avenue within Aughnacurra Estate to match the character of existing stone walls within the estate. |
| 12.43 | C | Ground levels within the residual lands at properties 539 and 540 shall be raised back towards the proposed N6 GCRR and planted with 1000 no. trees of between 1.0 and 2.0m in height in accordance with the details set out on Figure GCRR-SK-OH-652 in Appendix A.21.2. The soil grading and planting shall not interfere with the proposed Bat Roost Structure in property 540. |
| 12.44 | O | Consult with the landowner of Plot 195 in relation to the planting proposals to be established along their property boundary. |
| 12.45 | C | In accordance with measures provided for under Section 12.6.3.1 Project-wide Landscape Measures and associated Table 12.7 of Chapter 12 of this updated EIAR, any post-construction remnant areas within acquired portions of Plot 229 will be planted to locally appropriate native woodland species. |

## 23.10 Cultural Heritage

| Ref. No. | Stage | Commitments |
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| 13.1 | C | All work will be undertaken as part of a Stage (i)-(iv) Archaeological Services Contract and will be managed and overseen by the Project Archaeologist appointed by TII in consultation with the Project Engineer. All archaeological surveys, testing and excavation will be carried out in advance of the commencement of construction. |
| 13.2 | C | A programme of geophysical survey (where practicable), will be carried out within the footprint of the Project prior to construction going ahead. This will target greenfield and previously undisturbed areas within the Assessment Boundary. |
| 13.3 | C | Geophysical survey will be followed by archaeological test trenching, which will be carried out under Ministerial Directions in consultation with the DoHLGH and the Project Archaeologist. Dependant on the results of the investigations, further mitigation may be required such as preservation by record or in-situ. Any further mitigation will require the agreement of the National Monuments Service of the DoHLGH. Full provision will be made available for the excavation of any archaeological features and/or deposits that may be identified, if that is deemed the most appropriate manner in which to proceed. |
| 13.13 | C | Prior to demolition, the thatched cottage BH 12 will be subject to a full measured, written and photographic survey. This will be carried out by a suitably qualified person or team in consultation with the DoHLGH and the Project Archaeologist. |
| 13.4 | C | The demesne landscape associated with Menlo Castle (DL 8), at Dangan Lower (DL7) and at Bushypark House (DL4) will be subject to a detailed photographic and written record prior to the construction of the proposed N6 GCRR. This will be carried out by a suitably qualified person or team under Ministerial Directions in consultation with the DoHLGH and a TII Project Archaeologist. |
| 13.5 | C | All Cultural Heritage (CH) sites listed in Table 13.17 of Chapter 13of this updated EIAR that include built heritage remains will be subject to a detailed written and photographic survey (to include test trenching where appropriate). This shall be carried out under Ministerial Directions in consultation with the DoHLGH and a TII Project Archaeologist. Full provision will be made available for the excavation of any archaeological features and/or deposits that may be identified, if that is deemed the most appropriate manner in which to proceed. |
| 13.6 | C | Archaeological wade or underwater assessments will be carried out at any natural watercourses (AAPs) to be impacted upon by the proposed N6 GCRR by disturbance to their banks or beds. This shall be carried out under Ministerial Directions in consultation with the DoHLGH and a TII Project Archaeologist. Full provision will be made available for the excavation of any archaeological features and/or deposits that may be identified, if that is deemed the most appropriate manner in which to proceed. |
| 13.7 | C | Any section of Townland Boundary to be impacted upon will be subject to a detailed written and photographic survey (to include test trenching where appropriate). This shall be carried out under Ministerial Directions in consultation with the DoHLGH and a TII Project Archaeologist. Full provision will be made available for the excavation of any archaeological features and/or deposits that may be identified, if that is deemed the most appropriate manner in which to proceed. |
| 13.8 | C | Excavation (preservation by record) of all previously recorded archaeological sites – where these fall, in whole or in part, within the footprint of the development – will be carried out under Ministerial Direction in consultation with the DoHLGH and a TII Project Archaeologist. |
| 13.9 | C/O | Archaeological sites (AH) 15, 16 and 29 ~~11, 12, 23 and 26~~ will be subject to a detailed photographic and written landscape record to preserve their current setting prior to the construction and operation of the Project. This shall be carried out by a suitably qualified person or team under Ministerial Directions in consultation with DoHLGH and a TII Project Archaeologist. |
| 13.10 | C/O | Protected Structures (BH) 1, 7, 9, 10 and 17 will be subject to a detailed photographic and written landscape record to preserve their current setting prior to the construction and operation of the proposed N6 GCRR. This shall be carried out by a suitably qualified person or team under Ministerial Directions in consultation with the DoHLGH and a TII Project Archaeologist. |
| 13.11 | C/O | Cultural Heritage Sites (CH) 8, 20, 23, 25, 30, 32, 33, 36, 37, 57, 68, 70, 71, 72 and 78 will be subject to a detailed photographic and written landscape record to preserve their current setting prior to the |

| Ref. No. | Stage | Commitments |
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| | | construction of the proposed N6 GCRR. This shall be carried out by a suitably qualified person or team under Ministerial Directions in consultation with the DoHLGH and a TII Project Archaeologist. |
| 13.12 | C | In the area of Coolough Village, the above mitigation measures will be carried out in consultation with the representatives of the Menlo-Coolough-Ballinfoile-Ballindooley residents<br>~~The Cultural Heritage Specialist and Project Archaeologist will meet with the representative of the Menlo-Coolough-Ballinfoile-Ballindooley residents to inspect unrecorded features of possible cultural heritage interest associated with the old village of Coolough, Menlo. A report on the site inspection will be made available to residents and uploaded to a dedicated project website.~~ |
| 13.14 | C/O | DL 4, 7 and 8 will be subject to a detailed photographic and written landscape record to preserve their current setting prior to the construction and operation of the Project. This shall be carried out by a suitably qualified person or team in consultation with the DoHLGH and the Project Archaeologist. |

## 23.11 Soils and Geology

| Ref. No. | Stage | Commitments |
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| 9.1 | C | Construction techniques that comply with the requirements of statutory bodies in terms of noise, vibration, soil and groundwater contamination and disposal of contaminated material for both soil and rock cuttings will be adopted. |
| 9.2 | C | Loss or damage of Topsoil and Subsoil, and Loss of Solid Geology.<br>All earthworks will be undertaken in accordance with a project-specific earthworks specifications ensuring that all excavated material and imported material is classified appropriately so as to allow maximum opportunity for the reuse of materials on the Project.<br>Careful handling is essential to retain any existing structure and integrity of the excavated materials, where minimising agitation of the acrotelm will safeguard important processes such as carbon sequestration. The following principles will be employed when handling peat at the construction phase of the proposed N6 GCRR:<br>• Minimise plant movements and haul distances in relation to any peat earthworks activities by utilising the nearest available MDA (where peat is permitted)<br>• Appropriate temporary storage areas for excavated peat close to the excavation will be developed<br>• Peat placement will occur as soon as possible after excavation where practicable<br>Excavated topsoil will be stockpiled using appropriate methods to minimise the effects of weathering. Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff.<br>To reduce the compaction and erosion of topsoil outside the areas of direct construction, haul routes will be along predetermined routes as detailed in Chapter 7 of this updated EIAR and deliveries will be along predetermined routes outside the Project extents. Where compaction occurs due to truck movements and other construction activities on unfinished surfaces, remediation works will be undertaken to reinstate the ground to its original condition. Where practical, compaction of any soil or subsoil which is not part of the works or to remain in-situ within the site will be avoided.<br>The contractor will ensure that any excavated topsoil, subsoil or rock is assessed for re-use within the Project ensuring the appropriate handling, processing and segregation of the material. Where practical the removal of excavated material from the Project will be avoided. Any surplus suitable excavated material that is not required in the Project, will be reused on other projects where possible. The reuse of this material as a by-product on other construction sites would be subject to Regulation 27 notification to the EPA. This material would have to be shown to be suitable for such use and subject to appropriate control and testing according to earthworks specifications of the source and destination sites. Alternatively, the surplus excavated material will be disposed of at suitable authorised waste facilities.<br>Where appropriate, excavated material, including topsoil, subsoil, and crushed rock shall be reused as construction fill within the Project or placed in deposition areas. Excavated material will contribute to the construction material requirements for the Project. |
| 9.3 | C | The CEMP included in Appendix A.7.5 of this updated EIAR, which is a working document and will be updated and finalised by the Contractor following appointment and prior to the commencement of the construction works, so as to include any additional measures required pursuant to any decision to grant approval. It includes within it details of the requirements of a construction earthworks programme which the Contractor will implement prior to earthwork activities taking place. The earthworks programme will categorise the source of material for each fill section which have been set out and assessed in this updated EIAR at Sections 9.4.2.1 and 9.5.3. The detailed construction |

<table>
<tr><th>Ref. No.</th><th>Stage</th><th>Commitments</th></tr>
<tr><td></td><td></td><td>earthworks programme will outline the use of all cut material on the haulage routes are identified on Figures 7.1.001 and 7.1.002 and assessed throughout this updated EIAR and will set out the continuous monitoring of earthwork movement. During the finalisation of this programme, the Contractor shall adhere to the fill limitations outlined in the table below.<br><br>To prevent impact to the local peatland habitats, the following fill limitations will be incorporated at the locations identified in the table below.<br>• Only pavement and capping layers protected from surface water runoff and groundwater movements are permitted to be derived from non-native material<br>• All other compliant fill material will be derived from native material or other pH compatible material<br><br>Note: This table below replaces Table 9.19 in Section 9.6.2.1 of Chapter 9 of this updated EIAR.<br><br>Table 23.1 Fill Limitation Areas
<table>
<tr><th rowspan="2">Location</th><th rowspan="2">Annex I Habitat / Fossitt (2000) ID Codes*</th><th colspan="2">Fill Limitation Chainage area</th></tr>
<tr><th>From</th><th>To</th></tr>
<tr><td>1</td><td>4030 mosaic</td><td>0+620</td><td>0+775</td></tr>
<tr><td>2</td><td>*7130/4010 mosaic, 4010 and PF2</td><td>1+150</td><td>1+475</td></tr>
<tr><td>3</td><td>4010</td><td>1+830</td><td>2+050</td></tr>
<tr><td>4</td><td>4010</td><td>2+200</td><td>2+325</td></tr>
<tr><td>5</td><td>4010 and PF2</td><td>2+875</td><td>3+175</td></tr>
<tr><td>6</td><td>4010</td><td>3+450</td><td>3+550</td></tr>
<tr><td>7</td><td>4030/4010 and 4010</td><td>3+595</td><td>3+890</td></tr>
<tr><td>8</td><td>4030 mosaic and 4010</td><td>4+650</td><td>5+150</td></tr>
<tr><td>9</td><td>4010 and PF2</td><td>7+750</td><td>7+900</td></tr>
</table>
*Refer to Chapter 8, Biodiversity for details</td></tr>
<tr><td>9.4</td><td>C</td><td>A drainage layer or starter layer, in accordance with the TII publication CC-SCD-00606, will be implemented for the construction of embankments in areas prone to flooding. The introduction of a drainage layer will ensure hydraulic conductivity exists across the flood plain and removes the risk of the embankment acting as a flood barrier.</td></tr>
<tr><td>9.5</td><td>C</td><td>Earthworks haulage will be along predetermined routes within and outside the proposed development boundary as shown on Figures 7.101 to 7.123.<br>The identified haulage routes are along existing national, regional and local routes or within the proposed development boundary.<br>Where compaction occurs due to truck movements and other construction activities on unfinished surfaces, remediation works will be undertaken to reinstate the ground to its original condition. Where practicable, compaction of any soil or subsoil which is to remain in-situ along the Project will be avoided.</td></tr>
<tr><td>9.6</td><td>C</td><td>In the event where an embankment is constructed of local material in areas prone to flooding, the introduction of a drainage layer or starter layer will reduce the likelihood of run-off of fine material. Alternatively, the introduction of a geotextile separator will reduce the potential impact in areas. A composite system, combining a drainage layer and a geotextile separator will be implemented in embankments constructed with cohesive fill material. Sediment control methods are outlined in the CEMP in Appendix A.7.5 of this updated EIAR.</td></tr>
<tr><td>9.7</td><td>C</td><td>Ground settlement, horizontal movement and vibration monitoring will be implemented during construction activities to ensure that the construction does not exceed the design limitations. The design limitations will ensure no cosmetic damage to adjacent properties. In situations where the site specific blast design has determined that blasting is not feasible in a particular location due to</td></tr>
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| Ref. No. | Stage | Commitments |
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| | | excessive ground vibrations, alternative extraction methods such as hydraulic breaking, hydraulic splitting, chemical splitting and electrical disintegration may be implemented and monitored. Monitoring will be implemented during blasting, during excavation of cuts, for overburden slopes steeper than 1V:2H (V= vertical slope, H = horizontal slope) and rock slopes steeper than 1V:1.5H. As a precaution, prior to vibration and movement related construction works commencing (including blasting), pre-condition surveys will be undertaken for all receptors within a zone of influence.<br>The Employer's Site Monitoring Team will be monitoring the reports on a weekly basis to ensure compliance with the commitments in relation to vibration limits.<br>In the unlikely event that the blast vibration limit at the surface is exceeded, blasting works will cease on site until it is understood the basis for the increased vibration. The blast design will then be recalibrated and blasting works will proceed with continued monitoring.<br>A key contact person will be appointed during the construction phase to facilitate communications between affected property owners, informing them of proposed works in their area, including blasting.<br>After vibration and movement related construction works have ceased, a post condition survey will be undertaken for all receptors within a zone of influence. In the highly unlikely event that damage from vibration is observed, the damage will be repaired. |
| 9.8 | C | A geotechnical expert will be appointed by the Contractor and will be present to monitor the surrounding ground vibrations near sensitive receptors during blasting works. The Employer's Site Monitoring Team will be monitoring the reports on a weekly basis to ensure compliance with the commitments in relation to vibration limits. |
| 9.9 | C | A trial blast, and will be carried out as part of a blast assessment. The monitored trial blast will be undertaken in the same bedrock formation by the blasting contractor in a controlled location, not exceeding the vibration limitations of the local sensitive receptors, posing no risk to sensitive receptors including Annex I habitat in Lough Corrib cSAC. The trial blast will calibrate the blast design to a site specific design.<br>The blast target vibration limit is defined as 20mm/sec, 20% more conservative than the conservative design approach vibration limit of 25mm/sec at the ground surface which includes areas of Limestone pavement at Lackagh Tunnel. In addition, the Limestone pavement will be monitored during the tunnelling works for any effects from the blast vibrations. In the unlikely event that the blast target vibration limit at the surface is exceeded, blasting works will cease on site until it is understood the basis for the increased vibration. The blast design will then be recalibrated and blasting works will proceed with continued monitoring. Allowable distances for the various construction methods are given in the section above on Noise and Vibration.<br>The Employer's Site Monitoring Team will inspect the trial blast reports to check compliance with the limitation limits in vibration at surface. |
| 9.10 | C | Importation of materials from outside the site will be minimised by ensuring that materials arising within the site area are used to the greatest extent possible. Any surplus material remaining which cannot be incorporated into the construction fill activities shall be placed in material deposition areas within the Project.<br>Hazardous material will be transported off site for disposal or recovery at appropriately licence or permitted sites as outline above for Construction Activities. |
| 9.11 | C | Construction of structures will be completed in accordance with the CEMP in Appendix A.7.5. The construction of the River Corrib Bridge will meet the requirements of the: River Corrib Bridge Constructability Examination Appendix A.7.1; the Menlough Viaduct will meet the requirements of the Menlough Viaduct Constructability Examination Appendix A.7.2, the Lackagh Tunnel will meet the requirements of the Lackagh Tunnel Geotechnical and Hydrogeological Appraisal Appendix A.7.3 and the Galway Racecourse Tunnel will meet the requirements of the Galway Racecourse Tunnel Constructability Report Appendix A.7.4.<br>The adopted construction techniques will comply with the requirements of statutory bodies in terms of noise, vibration, soil and groundwater contamination and disposal of contaminated material. |
| 9.12 | C | For the construction of Lackagh Tunnel a hydrogeology and geotechnical expert will be appointed by the Contractor and will be present to monitor at all times when the construction activities have the potential to impact on groundwater or the Annex I habitats at the surface, namely Limestone pavement and Calcareous grassland. This includes the supported rock face of Lackagh Quarry Face and retaining walls for the Western Approach. Monitoring of the exposed rock slopes and retaining walls will be carried out during construction and operation to ensure there is no impact to the Annex I habitat. In the extremely unlikely event that instability is observed additional support measures will be installed to ensure that there is no impact to the Annex I habitat. The additional support measures comprise ground anchors, rock bolts, rock dowels, rock mesh, shotcrete or a combination of these measures, designed to the relevant design standards (Eurocode 7, BS8081) and best practice guidance documents.<br>The Employer's Site Monitoring Team will review weekly monitoring reports to check stability of rock slopes in Lackagh Quarry. |

| Ref. No. | Stage | Commitments |
|---|---|---|
| 9.13 | O | The rock and overburden retaining systems in Lackagh Quarry and Western Approach will continue to be monitored as part of the TII (Transport Infrastructure Ireland) maintenance schedule to ensure that they continue to operate as intended for the design life of the Project. In the extremely unlikely event that instability within the rock mass is observed additional support measures (e.g. rock bolts, rock dowels, rock mesh, shotcrete or a combination of these measures will be installed to ensure that there is no impact to the structural integrity[3] of the Limestone pavement. |
| 9.14 | C | Ground settlements will be controlled through selection of the foundation type and method of construction which are suitable for the particular ground conditions. To minimise soil movements due to pile operations in the vicinity of sensitive receptors, each pile shall be constructed sequentially in a direction away from the sensitive receptor. Previously installed piles act as a shield as soil movements are greater in a direction away from the stiffer zone i.e. away from the piles and sensitive receptors. |
| 9.15 | C | During construction, the Limestone pavement at Menlough Viaduct will be protected and will not be impacted by implementing a protection system comprising of geogrid, protection geotextile and layers of material. Refer to the Menlough Viaduct Constructability Report in Appendix A.7.2 of this updated EIAR for further details. |
| 9.16 | C | Samples of ground suspected of contamination will be tested for contamination during the detailed investigation and ground excavated from these areas will be disposed of to a suitably licence or permitted sites in accordance with the current Irish Waste Management legislation. |
| 9.17 | C | Good housekeeping (daily site clean-ups, use of disposal bins, etc.) on the site, and the proper use, storage and disposal of these substances and their containers will be implemented to prevent soil contamination.<br>For all activities involving the use of potential pollutants or hazardous materials, material such as concrete, fuels, lubricants and hydraulic fluids will be carefully handled and stored to avoid spillages. Potential pollutants shall also be adequately secured against vandalism and will be provided with proper containment according to codes of practice. Any spillages will be immediately contained and contaminated soil removed from the site and disposed of to an appropriately permitted or licenced site according to the current Irish Waste Management Legislation by the Contractor. |
| 9.18 | C | The Contractor will make provision for removal of any concrete wash water. Concrete trucks will be directed back to their batching plant for washout. The arrangement for concrete deliveries to the site will be discussed with suppliers before commencement of work, outlining the agreed assessed routes, prohibiting on site washout and discussing emergency procedures. |
| 9.19 | C | As a minimum, the carriageway drainage network will be sealed in areas where the Project crosses rock particularly prone to karstification. Through the use of engineered solutions, including an impermeable barrier, cement slurry or grout, direct run-off from the paved surface of the Project will be prevented from entering into the rock along the proposed alignment, as this could cause further deterioration and instability of the rock mass. Individual mitigation measures will be assessed on a case by case basis by the designer, determined by the extent of karst and make-up of the Project as outlined in the karst protocol which is part of the CEMP in Appendix A.7.5 of this updated EIAR. Inspections of karst features will be undertaken by a hydrogeologist and/or geotechnical expert in order to determine the appropriate remediation measure. These remedial measures include but are not limited to the removal of all loose, soft, weak or voided soil material, backfilling voids with an agreed combination of boulders cobbles / chunk rock / cement slurry and installation of a high strength geosynthetic to form a competent, safe foundation platform. |
| 9.20 | C | Where the design, including environmental mitigation measures, safety requirements and engineering constraints, permit significant bedrock cuttings will be designed to remain visible. Where this cannot be provided digital photographic records of significant new excavations will be recorded or visits from Geological Survey Ireland will be facilitated. |
| 9.21 | C | Where the design environmental mitigation measures, safety requirements and engineering constraints permit, significant bedrock cuttings will be designed to remain visible. Where this cannot be done, then digital photographic records of significant new excavations will be recorded by the Contractor and/or visits from Geological Survey Ireland will be facilitated by the Contractor. The Contractor shall notify the Geological Survey Ireland of bedrock cuttings to facilitate a site visit prior to any backfilling. |
| 9.22 | C | Where an area of habitat planting has a requirement for a free draining layer beneath the surface and it corresponds with a proposed Material Deposition Area where peat may be placed, a free draining layer will be placed by the Contractor between the peat placement layer and the habitat to be created layer. |

[3] Structural Integrity of the rockmass that supports the mosaic of Limestone pavement and Calcareous grassland is the physical and mechanical geotechnical properties that control the behaviour of the geotechnical Limestone pavement environment

| Ref. No. | Stage | Commitments |
|---|---|---|
| | | The free drainage material will be contained within a filter separator layer (e.g. geotextile), above and below to prevent the migration of fines sediment therefore ensuring the functionality of the layer.<br>For material deposition areas within Lackagh Quarry, where calcareous grassland is required, a contained drainage layer with a minimum depth of 350mm depth will be provided to ensure free drainage of surface water from the calcareous grassland. This layer will be provided between the calcareous grassland and the material deposition area. |
| 9.23 | C | Construction will adhere to all requirements outlined in Lackagh Quarry: Material Deposition Assessment Requirements in Appendix A.9.3 and A.9.3.b of this updated EIAR. |
| 9.24 | C | Construction will adhere to all requirements outlined in Material Deposition Areas – Baseline Report in Appendix A.9.3.a of this updated EIAR |
| 9.25 | C | The composition of the mixed peat in material deposition areas with calcareous grassland will ensure that the magnitude of immediate, primary and secondary consolidation will not exceed 250mm. |
| 9.26 | C | Good construction management practices will be employed to minimise the risk of transmission of hazardous materials as well as pollution of adjacent watercourses and groundwater. Measures to be implemented to minimise the risk of spills and contamination of soils and waters will include:<br>• Employing only competent and experienced workforce, and site-specific training of site managers, foremen and workforce, including all subcontractors, in pollution risks and preventative measures.<br>• Ensure that all areas where liquids (including fuel) are stored, or cleaning is carried out, are in designated impermeable areas that are isolated from the surrounding area and within a secondary containment system, e.g., by a roll-over bund, raised kerb, ramps or stepped access.<br>• The location of any fuel storage facilities will be considered in the design of all construction compounds and will be fully bunded. These are to be designed in accordance with relevant and current guidelines and codes of best practice at the time of construction.<br>• All concrete mixing and batching activities will be located in designated areas away from watercourses and drains.<br>• Potential pollutants will be adequately secured against vandalism in containers in a dedicated secured area.<br>• Provision of proper containment of potential pollutants according to relevant and current codes of practice and legal requirements.<br>• Thorough control during the entire construction stage to ensure that any spillage is identified at early stage and subsequently effectively contained and managed.<br>• Spill kits to be provided and to be kept close to the temporary construction compounds. Staff to be trained on how to use spill kits correctly. |
| 9.27 | C | Prior to backfilling / removal of portions of the existing exposed rock face for the existing road cutting along the existing N6 in Doughiska (GC001), the Contractor shall notify the GSI to ensure a site visit can be arranged for an assessment of the rock face prior to backfilling / removal.<br>Where the design permits (including environmental mitigation measures, safety requirements and engineering constraints), significant bedrock cuttings will be designed to remain visible. Where this cannot be achieved, digital photographic records of significant new excavations will be recorded by the Contractor and/or visits from GSI will be facilitated by the Contractor.<br>In addition, the Contractor shall notify the GSI of bedrock cuttings to facilitate a site visit prior to any backfilling. |

## 23.12 Hydrogeology

| Ref. No. | Stage | Commitments |
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| 10.1 | C | No dewatering will occur during construction at Menlough Viaduct or Lackagh Tunnel (or its approaches). Furthermore, the construction sequence will take into account the seasonal groundwater fluctuation. During the winter groundwater high it may be necessary to limit the depth of works so that dewatering is not required. |
| 10.2 | C | Galway Granite Batholith EW01, 02 (three cuttings), 04, 07 and 09: Groundwater intercepted will be collected and piped to the surface water receptor it would naturally have drained to. |
| 10.3 | C | Limestone: Construction dewatering of the bedrock aquifer may seasonally be required in EW27 during peak groundwater levels. Any dewatering will be discharged to the same groundwater body. |
| 10.4 | C | Construction of the Galway Racecourse Tunnel and its approaches will require dewatering of the bedrock aquifer. All groundwater intercepted will be managed and discharged within the same groundwater body. |
| 10.5 | C | EW27: Groundwater will be controlled within the excavation by collection in drains or sumps. If groundwater is intercepted, it will be piped and discharged at an infiltration basin within the same groundwater body. Intercepted groundwater is controlled and infiltrates back to the same groundwater body. |
| 10.6 | C | Where infiltration basins are used for discharge of site runoff during construction the runoff will be managed on site, collected and treated as per the Sediment Erosion and Pollution Control Plan (Refer to Section 8 of the CEMP in Appendix A.7.5). |
| 10.7 | C | Infiltration basin S19a and S19b include lining the sides of the excavation to ensure vertical groundwater infiltration so that all discharges drain through the placed subsoil for the full thickness of the unsaturated zone. |
| 10.8 | C | The following measures included in the CEMP will be implemented to control the potential for pollution from accidental spillages on site:<br>• Stockpiling of contaminated material is not permitted.<br>• Good housekeeping on the site during construction, and the proper use, storage and disposal of these substances and their containers will prevent groundwater contamination.<br>• For all activities involving the use of potential pollutants or hazardous materials, under the CEMP, the Contractor will be required to ensure that material such as concrete, fuels, lubricants and hydraulic fluids will be carefully handled and stored to avoid spillages. Potential pollutants shall also be adequately secured against vandalism and will be provided with proper containment according to codes of practice. Any spillages will be immediately contained and contaminated soil removed from the site and properly disposed of.<br>• The Contractor will finalise the Incident Response Plan in the CEMP in Appendix A.7.5 prior to work commencing and regularly update it for pollution emergencies which will be developed by the appointed Contractor. The Contractor shall implement all the measures detailed in Incident Response Plan. |
| 10.9 | C | In the event of karst being encountered the Karst Protocol shall be implemented, which is documented in the CEMP (Appendix A.7.5):<br>Where karst features are encountered during construction works these will be assessed by a hydrogeologist and an engineering geologist. In the case of excavations (road cuttings, tunnels, bridge pier excavations) then the karst feature shall be excavated and backfilled with course fill and sealed.<br>With regard to karst features being intercepted in excavations for earthworks (including viaducts, bridges and tunnels) and infiltration basins. The Karst Protocol preserves the hydraulic connectivity of the feature using granular material to fill but then seals the karst from the excavation using a liner (geotextile and or concrete depending on the site specifics).<br>Where dewatering of the bedrock aquifer is proposed, groundwater level monitoring will be installed before construction, during the construction phase and 12 months following construction to enable potential effects from dewatering to be identified. If the monitoring indicates there is a measurable impact beyond that stated in this updated EIAR, then work with the potential to increase drawdown will be made safe and cease until the hydrogeological assessment is revised based on the site conditions and mitigation employed if appropriate.<br>In order to reduce potential contamination impacts, stockpiling of contaminated material and leachate generation will be prohibited. In the situation that potential contaminated material is encountered it will be tested and disposed of in an appropriate manner and in line with current water management legislation. If it is not possible to immediately remove contaminated material, then it will be stored on, and covered by, polythene sheeting to prevent rainwater infiltrating through the material. The time frame between excavation and removal will be kept to an absolute minimum. |

| Ref. No. | Stage | Commitments |
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| 10.10 | C | Nine wells (~~W50-02~~, W50-10, W50-12, W50-13, W50-14, W50-15. W50-16. W50-17, W50-18, W50-19 ~~W50-20, W500-01, W1000-03~~) will be lost during the construction of the Project. These will each be mitigated by providing a replacement well, connecting to mains supply where available or by financial compensation. Where wells have to be abandoned as part of the Project they will be sealed and abandoned in general accordance with Well Drilling Guidelines produced by the Institute of Geologists of Ireland (IGI 2007). |
| 10.11 | C | Replacement wells, storage tank, associated pumping equipment and pipework for Wells W50-13 and W50-14 will be commissioned and tested to ensure adequate yield rates in advance of wells W50-13 and W50-14 being decommissioned. |
| 10.12 | C | Wells outside of the Assessment Boundary but within the drawdown zone of influence may be impacted by reduced groundwater levels during construction. All wells within 150m of Assessment Boundary (or 50m from the calculated drawdown ZoI if greater) will be monitored for water level on a monthly basis for 12 months before construction, during construction and for 12 months after construction. If the monitoring indicates that the Project has impacted on a supply or geothermal well then mitigation will be applied. |
| 10.13 | C | To ensure the protection of quality of groundwater potable supplies, all wells within 150m of the proposed development boundary will be monitored for water quality on a monthly basis. All wells will be monitored for standard drinking water quality parameters on a monthly basis for 12 months before construction, during construction and for 12 months after construction. If the monitoring indicates that the Project has impacted on a supply, then mitigation will be applied. |
| 10.14 | C | The groundwater dependent terrestrial ecosystems (GWDTE) that have been flagged as being at risk are all in areas where the groundwater pathways are karstic. In this regard the Karst Protocol, as detailed above, forms part of mitigation to prevent groundwater quality or quantity being impacted. Additional mitigation is also employed to ensure that European sites are not impacted. |
| 10.15 | C | There will be no surface water discharges to the Coolagh Lakes and all runoff will be treated before being discharged to ground at infiltration basins. Infiltration basins are designed to include settlement to remove sediment and have an appropriate thickness of subsoil below invert level. |
| 10.16 | C | Pouring of the concrete in excavations (River Corrib Bridge, Menlough Viaduct and Lackagh Tunnel) will only be undertaken when the excavation has been inspected by a qualified hydrogeologist. Inspection of the full depth and extent of each excavation will be undertaken to identify if any significant flow paths, such as the karst enhancement of the bedrock permeability, are present. If no significant flow paths are present, then the hydrogeologist will document accordingly and confirm that there is no risk to groundwater from concrete leakage. If significant pathways are present then impacts which may arise from flow along these pathways shall be designed by the hydrogeologist based on the karst mitigation plan, these may comprise of installing a high permeability zone to replace the groundwater pathways which would be removed by the foundations and/or sealing the linkage from excavation to protect the karst. The design of the mitigation measures shall be approved by a qualified hydrogeologist to confirm that there will be no negative impacts to groundwater. |
| 10.17 | O | During the operational phase of Project inspection and maintenance will occur to ensure that the infiltration basins continue to operate as intended for the design life of the Project. |
| 10.18 | O | Infiltration basins require regular inspection to confirm that no observable subsidence in the infiltration has occurred due to karst. Inspection is recommended on 5-year frequency. |
| 10.19 | O | If karst features and potential pathways are found to be present during inspection, then the Karst Protocol developed for the construction phase will be implemented to ensure that no preferential pathways have formed within the infiltration basin. |
| 10.20 | C | In the unlikely event of significant flow paths (fault or fracture zones) being encountered in the Galway Granite Batholith during construction, measures set out in the Karst Protocol included in the CEMP in Appendix A.7.5 of this updated EIAR and Appendix C of the updated NIS will be implemented. |
| 10.21 | C | All buildings within 50m of the Assessment Boundary or the zone of influence of dewatering (whichever is greater) will be offered a property condition survey (as per ABP Inspectors' Report dated 22 June 2021) |

## 23.13 Hydrology

| Ref. No. | Stage | Commitments |
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| 11.1 | C | The CEMP included in Appendix A.7.5 will be finalised by the Contractor in advance of the commencement of construction and the following will be implemented as part this plan:<br>• An Incident Response Plan (Refer to Section 10 of the CEMP in Appendix A.7.5) detailing the procedures to be undertaken in the event of spillage of chemical, fuel or other hazardous wastes, logging of non-compliance incidents and any such risks that could lead to a pollution incident, including flood risks<br>• A Sediment Erosion and Pollution Control Plan (Refer to Section 8 of the CEMP in Appendix A.7.5). This shall include water quality monitoring and method statements to ensure compliance with environmental quality standards specified in the relevant legislation<br>• All necessary permits and licenses for instream construction works associated with the provision of culverts, bridges and outfalls. OPW Section 50 consent has been received for all culverts and bridges proposed in this updated EIAR. Changes to these structures as part of the detailed design and construction stage will require new Section 50 consent to be obtained<br>• Inform and consult with OPW Western Arterial Drainage Section who have responsibility for the Corrib-Mask Arterial Drainage scheme and the ongoing control of river and lake levels at the Salmon Weir Barrage in Galway City<br>• Continue to inform and consult with Inland Fisheries Ireland (IFI)<br>• Continue to inform and consult with National Parks and Wildlife Service (NPWS)<br>• All construction works will be carried out in accordance with best practice construction guidance and as such will eliminate the risk of spillage to the River Corrib<br>• All works will also be carried out in accordance with Irish Water Standards and Specifications, in line with standard processes and procedures for obtaining connection consent and build over agreements with the utility provider<br>• Future proofing sleeves in the vicinity of Ardaun can be easily accommodated and their location will be agreed with Irish Water prior to commencement of construction.<br>• Irish Water (IW) will be consulted in the updating of the CEMP and specifically the and the incident response plan (IRP) for construction and operation stages<br>• Provision will be made for Irish Water Staff to visit the construction site if deemed necessary by Irish Water<br>• Ongoing liaison with Irish Water will be provided at construction stage and procedures for regular project dates will be established during the construction stage in a timely manner so as to enable Irish Water to assess potential increased risk to the water quality of their potable water supply source |
| 11.2 | C | Construction activities will be required to take cognisance of the ~~all~~ following relevant guidance documents for construction work on, over or near water including:<br>• Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016)<br>• Shannon Regional Fisheries Board – Protection and Conservation of Fisheries Habitat with particular reference to Road Construction<br>• Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites (Eastern Regional Fisheries Board)<br>• Central Fisheries Board Channels and Challenges – The Enhancement of Salmonid Rivers.<br>• CIRIA C793 The SuDS Manual<br>• CIRIA C624 Development and Flood Risk – guidance for the construction industry<br>• CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors<br>• CIRIA C648 Control of Water Pollution from Linear Construction Projects, technical guidance<br>• CIRIA C649 Control of Water Pollution from Linear Construction Projects, site guide<br>• Guidelines for the Crossing of Watercourses during the Construction of National Road schemes (NRA, 2006)<br>• Road Drainage and the Water Environment DN-DNG-03065 (TII, June 2015)<br>• Vegetated Drainage Systems for Road Runoff DN-DNG-03063 (TII, June 2015) |
| 11.3 | C | As set out in the Sediment Erosion and Pollution Control Plan (Refer to Section 8 of the CEMP), the sediment, erosion and pollution controls will be monitored and maintained throughout the construction of the Project. This shall include the regular water quality monitoring for sediments and hydrocarbons (monitoring the sediment concentrations in the receiving water) and the inspection of the pollution |

| Ref. No. | Stage | Commitments |
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| | | control facilities and method statements to ensure compliance with environmental quality standards specified in the relevant legislation. |
| 11.4 | C | Separate from the on-going and detailed monitoring carried out by the Contractor as part of the CEMP; the Environmental Manager (EM) shall carry out the inspection/monitoring regime described below on behalf of the Employer. The results will be stored in the EM's Monitoring file and will be available for inspection/audit by the Client, NPWS or IFI and OPW (where relevant). All inspections/monitoring/results will be recorded on standard forms. Inspections will include the following:<br>• Inspect the Principal Control Measures outlined in the CEMP on a weekly basis. Report findings to the Contractor.<br>• Inspect surface water treatment measures (ponds, tanks, mini-dams, sandbags, etc.) on a daily basis and obtain turbidity readings in the outlet receiving water.<br>• Inspect all outfalls to watercourses and groundwater bodies on a daily basis and obtain turbidity readings. Where excavation, deposition, pumping out or concreting works are on-going in the vicinity obtain turbidity readings three times per day in the outlet receiving water.<br>• Daily visual inspection of watercourses to which there is a discharge from the works and those where there is construction works in the vicinity.<br>• Wheel wash facilities shall be inspected on a weekly basis.<br>• Stockpiles shall be monitored on a daily basis while being filled or emptied and otherwise on a weekly basis.<br>• Control measures for works at or near water bodies shall be inspected on a daily basis.<br>• Concrete operations at or near watercourses shall be supervised and designated chute washing out facilities shall be inspected on a daily basis.<br>• Site compounds and satellite compounds shall be inspected on a weekly basis.<br>• The Contractor's monitoring results shall be audited by the SEM on a frequent basis (6 times per quarter at a minimum).<br>• The investigatory level for turbidity is defined as a 10ntu difference between the ambient upstream watercourse level and the level downstream of the works.<br>• Notwithstanding the stringent prevention measures listed above, in the unlikely event of an accidental release of sediment to a watercourse causing plumes or in the unlikely event of an exceedance of the turbidity investigatory levels arising, the following shall take place:<br>– It shall be investigated immediately and thoroughly by the EM and the Contractor.<br>– The Incident Response Plan shall be activated.<br>– The relevant NPWS, IFI and local authority staff will be notified immediately.<br>– The Contractor will be required to take immediate action to detect source of release, corrective action to prevent release and to implement measures to ensure that such discharges do not re-occur.<br>– Works if stopped shall not recommence until appropriate corrective measures to avoid any repetition are put in place. Such measures shall be agreed with the EM following consultation with the NPWS and IFI.<br>– Works and/ or discharges from the works shall not recommence until written consent is received from the EM.<br>Where the EM considers that the risk of a sediment release is high for a particular construction activity, he/she shall inform the Contractor and request protective action to be taken before the construction activity commences. The EM will be delegated powers under the contract sufficient for these instructions to be issued and implemented. |
| 11.5 | C/O | Water Quality Monitoring will be required prior to, during and post construction. Baseline water quality sampling shall commence a minimum of six months prior to construction and conclude a minimum of three months after full operation has commenced to assess potential residual impact. Turbidity monitoring will be included in sensitive watercourses downstream of the Project crossings. The local authority will make recommendations regarding all the water quality parameters to be assessed, the sampling interval and locations. However, as a minimum requirement there will be monthly water quality analysis from a minimum of one upstream and one downstream sampling point at each construction water outfall and surface water crossing point. Furthermore, turbidity monitoring will be carried out on a daily basis.<br>The Employer's Site Monitoring Team will review weekly monitoring reports to check water quality at receiving watercourses. |

| Ref. No. | Stage | Commitments |
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| 11.6 | C | The following outlines the principal environmental commitments that will be prescribed for the construction phase in order to protect all catchment, watercourse and ecologically protected areas from direct and indirect impacts:<br>• All constructional compound areas will be required to be located on dry land and set back from river and stream channels and out of floodplain areas. Floodplain areas include the Flood Risk Zones A and B (i.e. outside of the present day 100year and 1000year flood extents)<br>• The storage of oils, fuel, chemicals, hydraulic fluids, etc. will not occur within 100m of the River Corrib or within the floodplain area as defined in this updated EIAR<br>• Surface water flowing onto the construction area will be minimised through the provision of temporary berms, diversion channels and cut-off ditches, where appropriate.<br>• Management of excess material stockpiles to prevent siltation of watercourse systems through runoff during rainstorms will be undertaken. This may involve allowing the establishment of vegetation on the exposed soil and the diversion of runoff water off these stockpiles to the construction settlement ponds and avoiding stockpiling of material in vicinity of sensitive watercourses.<br>• Where construction works are carried out adjacent to turloughs, fens, stream and river channels and lakes, protection of such waterbodies from silt load shall be carried out through use of reserved grassed buffer areas, timber fencing with silt fences or earthen berms. These measures will provide adequate treatment of constructional site runoff waters before reaching the watercourses.<br>• Use of settlement ponds, silt traps and bunds and minimising construction activities within watercourses. Where pumping of water is to be carried out, filters will be used at intake points and discharge will be through a sediment trap or sedi-mat.<br>• All watercourses that occur in areas of land that will be used for site compound/storage facilities will be fenced off at a minimum distance of 5m. In addition, measures will be implemented to ensure that silt laden or contaminated surface water runoff from the compound site does not discharge directly to the watercourse. Compounds shall not be constructed on lands designated as Flood Zone A or B in accordance with the OPW's The Planning System and Flood Risk Management Guidelines (November 2009). Site compounds will not be permitted in a European Sites (i.e. Lough Corrib SAC).<br>• Protection measures will be put in place to ensure that all hydrocarbons used during the construction phase are appropriately handled, stored and disposed of in accordance with the TII document "Guidelines for the crossing of watercourses during the construction of National Road Schemes". All chemical and fuel filling locations will be contained within bunded areas and set back a minimum of 10m from watercourses and floodplain areas.<br>• Foul drainage from all site offices and construction facilities will be contained and disposed of in an appropriate manner to prevent pollution.<br>• The construction discharge will be treated such that it will not reduce the environmental quality standard of the receiving watercourses.<br>• Riparian vegetation along the identified sensitive watercourses will be fenced off to provide a buffer zone for its protection to a minimum distance of 5m except for proposed crossing points.<br>• The use and management of concrete in or close to watercourses will be carefully controlled to avoid spillage. Where on-site batching is proposed, this activity will be carried out well away from watercourses. Washout from such mixing plants will be carried out only in a designated contained impermeable area.<br>• All material deposition areas must be adequately bunded and compartmentalised such that the rainwater outflow from these facilities is adequately controlled and treated prior to reaching the receiving surface watercourses. The sediment control requirements are set out in the Sediment, Erosion and Pollution Control Construction Management Plan section of the CEMP (refer to Appendix A.7.5) |
| 11.7 | O | The flood relief mitigation measures to eliminate the flood risk of the proposed N6 GCRR on the N83 Tuam Road and reduce the existing flood risk in this area are described as follows (refer also to Figure 11.6.001 and Table 11.41 of Chapter 10, Hydrology):<br>• Prevent the upgraded portion of the N83 Tuam Road from spilling laterally northwards into the driveways of existing flood risk houses by:<br>– Upgrade and provide effective road drainage network along the existing N83 Tuam Road for a length of 780m<br>– Provide interceptor drain to capture rapid hill slope runoff from the southeast reaching the N83 Tuam Road<br>– Provide for infiltration of this interceptor drain for the less severe rain storm events<br>– Connect this interceptor drain to the proposed flood compensation storage |

| Ref. No. | Stage | Commitments |
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| | | – Compensate flood storage lost by providing compensation storage of 8,030m$^3$ in the form of an excavated rectangular engineered storage pond. The base elevation of 16m OD and a top design water level elevation of 17.5m OD<br>– Connect this compensation storage to the remaining low-lying natural flood storage area located to the northwest of the proposed N6 GCRR so that both storage areas are hydraulically linked via culverts.<br>– Provide for permanent a pumping station and rising mains from the proposed compensation flood storage facility to discharge to the existing storm sewer with maximum pumping capacity of 250l/s |
| 11.8 | O | Refer also to Table 11.51 in Chapter 11, Hydrology which outlines the required storage volumes required for the catchment for a range of return periods and durations events.<br>The required flood storage, with an available pumping rate of 0.25cumec (i.e. 250l/s) from the engineered storage pond, is 20,700m$^3$ for the 100year event which is further increased to 24,800m$^3$ to include for 20% climate change<br>The available storage provided in the engineered storage pond at a top water level of 17.5m OD is compensation storage of 8,030m$^3$ and the remaining (with the Project) natural storage provided of 18,470m$^3$ gives a total available flood storage of 26,500m$^3$, which is sufficient to achieve to meet and exceed the required storage. |
| 11.9 | O | To minimise the residual flood risk associated with the blockage of flood relief culverts and associated drainage assets there will be regular (monthly) inspection of N83 Flood Relief facilities be carried out to ensure that the system is in proper working order and performing as designed. |
| 11.20 | C/O | Throughout the project construction and operation phases Galway County Council will continue to consult and inform with Irish Water in respect to water quality and pollution risk to their potable water supply source. |
| 11.21 | C | Material deposition areas will be bunded or excavated sites and will have double erosion control fencing (silt fence) and a sediment settlement pond at the outlet which will be constructed in advance of their use as deposition areas. In addition, wheel wash facilities will be provided at the entrance/exit as outlined in the CEMP – see Appendix A.7.5.<br>Runoff from the material deposition areas will be treated in temporary settlement ponds which will be provided upstream of the outfall to the receiving watercourse or sewer. These ponds will be maintained until the material deposition areas have stabilised and become adequately vegetated. In addition, the specific construction sequence for these areas (described below) will allow for settlement of sediment prior to discharge to the receiving watercourse. The construction sequence of each of the material deposition areas is such that the area allocated for material deposition is compartmentalised to allow a deposition area to be first established in one compartment, while the runoff water from this compartment flows into and is contained within an adjacent compartment. This will allow settlement of sediment to take place. Once settlement of the sediments has occurred, this settlement area is then itself filled with peat and the adjacent compartment acts as the settlement area for the runoff from this section. This process is repeated as the works advance.<br>The construction sequencing and design of the material deposition areas will ensure that there will be negligible impact on adjacent watercourses. As part of the CEMP a plan for erosion and sediment control has been developed which deals specifically with the potential impacts of the material deposition areas and this is attached in Appendix A.7.5. |
| 11.22 | C/O | The Incident Response Plan which forms part of the CEMP included in Appendix A.7.5 of this updated EIAR and which will be finalised by the Contractor following appointment and prior to the commencement of the construction works, so as to include any additional measures required pursuant to any decision to grant approval will include flood and environmental risk management in adherence with the commitments presented in this chapter of this updated EIAR. |

## 23.14 Biodiversity

| Ref. No. | Stage | Commitments |
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| **General** | | |
| 8.1 | C/O | All measures within this section will be implemented by the Contractor under the supervision of the supervision of the Project Ecologist (employed by the Employer) and/or the Ecological Clerk of Works (employed by the Contractor).<br>Galway County Council (GCoC)/Transport Infrastructure Ireland (TII) will have a Site Monitoring Team which will include the Project Ecologist, who will be available for the duration of the construction phase for the Project.<br>GCoC and Transport Infrastructure Ireland will be responsible for implementing and delivering the post-construction monitoring programme, and any maintenance required in relation to same, for the lifetime of the Project. |
| 8.69 | C/O | Galway County Council (GCoC) will ensure that the results of monitoring will be used to inform the long-term ecological mitigation programme and any necessary timely corrective action. During construction, monitoring and any required corrective action, will be Galway County Council's (GCoC) responsibility as outlined in the Schedule of Environmental Commitments. During operation, GCoC will engage the services of a suitable contractor to monitor the ecological mitigation measures for the lifetime of the project. All the relevant requirements set out in the Schedule of Environmental Commitments, in relation to monitoring and maintenance of the ecological mitigation measures over the lifetime of the project, will be included as conditions in the contract(s) entered into with the appointed contractor. GCoC shall ensure that provision is made, in the contract(s) entered into with the appointed contractor, for corrective action to be undertaken if any aspects of the implementation of the ecological mitigation measures and monitoring commitments proposals are not effective. These provisions shall include a requirement for a suitably qualified ecologist/biodiversity expert to review the efficacy of any corrective actions required. |
| 8.70 | C/O | • A GIS mapping system will be developed, to allow the Project Ecologist to track the progress, completion and monitoring of the ecological mitigation measures<br>• At the end of each month, any mapping relating to ecological mitigation measures, including results of pre-construction surveys (e.g. locations of badger setts) or design changes for mitigation measures (e.g. change in location of artificial Badger sett), will be uploaded to the dedicated project website. In addition, at the end of each month any ecological monitoring reports will be uploaded to a dedicated project website<br>• Notwithstanding the point above ecological monitoring reports will be submitted to the Planning Authority and copied to the NPWS<br>• The Project Ecologist in conjunction with 'permits to work' will sign off the correct completion and functioning of the measures, where works are in ecologically sensitive locations and/or are ecologically sensitive activities, which are likely to include, but may not be limited to, the following:<br>– works involving vegetation removal/site clearance<br>– works involving installation of site fencing<br>– works in or adjacent to the Lough Corrib cSAC<br>– works in or adjacent to any watercourses<br>– works in or adjacent to any known breeding, resting or hibernating locations of any species protected under either the Birds and Habitats Regulations 2011 or Wildlife Act, in particular bats and otter<br>– works in areas where mitigation measures (including either habitat creation/mitigation or provision of nest and bat boxes) are proposed<br>– works in or adjacent to donor and receptor sites identified for the creation of habitats, until such time as any donor material required for the receptor sites has been transported<br>• Once ecological mitigation measures have been implemented and installed, GIS mapping files of their final as-built locations will be sent to the Project Ecologist to be uploaded into the Local Authority's GIS and planning systems<br>• Interactive or real-time/live mapping systems would be onerous to provide and manage. It is not deemed either necessary or appropriate to provide such systems given the above proposals which together will achieve the same function, purpose and results as a real-time/live mapping system |
| **Designated Areas for Nature Conservation** | | |
| 8.2 | C/O | The environmental commitments required to ensure that the Project will not result in a likely significant effect (i.e. adversely affect the integrity of) on the European sites within its ZoI include measures to: |

| Ref. No. | Stage | Commitments |
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| | | • Minimise habitat loss in Lough Corrib SAC and to avoid loss of QI habitats within Lough Corrib SAC during construction and operation (refer to Habitats Section below).<br>• Maintain the structural integrity of the rock mass supporting QI habitats in Lough Corrib SAC during the construction of the proposed Lackagh Tunnel (and its western approach) during construction and operation (refer to soils and geology environmental commitment 9.9, 9.11 to 9.17).<br>• Avoid habitat degradation in Lough Corrib SAC, Galway Bay Complex SAC, Lough Corrib SPA and Inner Galway Bap SPA as a result of potential hydrogeological impacts during construction and operation (refer to Hydrogeology Section).<br>• Protect water quality in receiving watercourses during construction and operation (Lough Corrib SAC, Galway Bay Complex SAC, Lough Corrib SPA and Inner Galway Bap SPA) (refer to Hydrology Section).<br>• Control dust emissions during construction to prevent impacts on vegetation in Lough Corrib SAC (refer to Air Quality Section).<br>• Avoid the introduction or spread of non-native invasive species to European sites (Lough Corrib SAC, Galway Bay Complex SAC, Lough Corrib SPA and Inner Galway Bap SPA).<br>• Avoid/reduce the disturbance/displacement effects of blasting on wintering birds using Ballindooley Lough (Lough Corrib SAC, Galway Bay Complex SAC, Lough Corrib SPA and Inner Galway Bap SPA) (Refer to wintering birds section below).<br>• Avoid the proposed N6 GCRR restricting Otter movement within the Bearna Stream catchment (Lough Corrib SAC, Galway Bay Complex SAC, Lough Corrib SPA and Inner Galway Bap SPA) (Refer to Otter section below).<br>• Avoid mortality of the QI species (Lough Corrib SAC and Galway Bay Complex SAC). These include both measures to ensure that construction materials are not introduced into the River Corrib and to remove the risk of Otter being killed/injured due to collisions with road traffic (Refer to Otter section below).<br>• Ensure that habitats are not degraded through impacts related to construction-related traffic on the wider, existing road network (Lough Corrib SAC, Lough Corrib SPA, Galway Bay Complex SAC, Inner Galway Bay SPA, Ardrahan Grassland SAC, Castletaylor Complex SAC, Kiltiernan Turlough SAC, Lough Fingall Complex SAC, Rahasane Turlough SPA, Rahasane Turlough SAC and Cregganna Marsh SPA) |
| 8.3 | C/O | The environmental commitments that are required to ensure that the Project will not significantly affect Moycullen Bogs NHA are as follows:<br>• Measures to control dust emissions during construction to prevent impacts to vegetation/habitats within Moycullen Bogs NHA at Tonabrocky – see Air Quality Section above. These include control measures such as spraying of exposed earthwork activities and site haul roads during dry weather, wheel washes, control of site vehicle speeds, road sweeping and dust screens.<br>• Measures to avoid the introduction or spread of non-native invasive species to Moycullen Bogs NHA during construction or operation. These are detailed in the Non-Native Invasive Species Management Plan which forms part of the CEMP in Appendix A.7.5.<br>• Measures to ensure that the planting and sowing scheme does not include non-native tree species in proximity to Moycullen Bogs NHA.<br>• Measures to control surface water runoff from the construction site to prevent an accidental pollution event affecting peatland habitats within Moycullen Bogs NHA at Tonabrocky – see Hydrology Section above.<br>• In the unlikely event of significant flow paths (fault or fracture zones) being encountered in the Galway Granite Batholith during construction, measures set out in the Karst Protocol included in the CEMP in Appendix A.7.5 will be implemented.<br>• Measures to control dust emissions during construction to prevent impacts to vegetation/habitats within Furbogh Wood pNHA, Kiltullagh Turlough pNHA, Ballycuirke Lough pNHA, Drimcong Wood pNHA and Turloughcor pNHA – see Air Quality Section above. These include control measures such as spraying of exposed earthwork activities and site haul roads during dry weather, wheel washes, control of site vehicle speeds, road sweeping and dust screens. |
| **Habitats** | | |
| 8.4 | C | To minimise the loss of Annex I habitat, areas of these habitat types within the Assessment Boundary but which are not required to construct the Project will be retained and fenced off for the duration of construction. These are shown on Figures 8.38.1 to 8.38.15. |
| 8.5 | C | To minimise the loss of habitat associated with the Project, there are also areas within the Assessment Boundary which are included for mitigation planting where general construction works will not be undertaken. These are shown on Figures 8.38.1 to 8.38.15. |

| Ref. No. | Stage | Commitments |
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| 8.6 | C | The minimum working area to facilitate the construction of the supporting structures associated with the proposed River Corrib Bridge will be used. This area will be clearly delineated and fenced off at the outset of works and maintained for the duration of the construction programme. No works for the construction of the River Corrib Bridge within Lough Corrib SAC boundary will be undertaken outside of this zone. |
| 8.7 | C | Where possible, woodland, scrub, treelines and hedgerows which lie within, or along the proposed N6GCRR, that are not directly impacted by the proposed road alignment or drainage will be retained. These areas will be protected for the duration of construction works and fenced off at an appropriate distance. Vegetation to be retained is shown on Figures 8.38.1 to 8.38.15and on Figures 12.2.01 to 12.2.15 (landscape design). |
| 8.8 | C | Areas of river channel and bankside vegetation which lie within, or along the boundary of the proposed N6 GCRR, that are not directly impacted by the proposed road alignment or drainage will be retained. These areas will be protected for the duration of construction works and fenced off at a distance of 5m from the stream/river bank. |
| 8.9 | C | The Petrifying spring feature present in Lackagh Quarry, which lies c.25m to the north of the mainline of the proposed N6 GCRR at Ch. 11+400, will be retained and shotcrete[4] will not be used as part of the quarry face stabilisation measures at the spring site.<br>To retain the potential for new petrifying spring features to develop in Lackagh Quarry, construction works at the quarry face, which comprise of the material deposition area (MDA) placement and the slope stability measures, will facilitate the development of new petrifying springs in the following manner:<br>• As part of the MDA placement the groundwater regime (both discharge and recharge) will be maintained by the inclusion of a free draining material where the MDA is in contact with the rock face and the quarry base<br>• As part of the slope stability measures for the exposed rock face the groundwater regime will be maintained through existing cracks and fissures as much as possible or through weep holes where shotcrete is required. These weep holes will permit free drainage of groundwater from the rock face and are likely to form new spring locations<br>If required by ABP, new spring features will be created by installing drill holes (<5cm diameter and c.1-2m in length) from the quarry face into the rock mass. These drill holes will be installed in accordance with the rock bolt measures as set out in the Construction Environmental Management Plan in Appendix A.7.5. |
| 8.71 | C | Excavated blocks of limestone pavement will be retained for reuse for general wildlife and habitat creation within those lands along the east bank of the River Corrib in Menlough which are proposed for habitat retention, enhancement and creation. |
| 8.10 | C | Any vegetation (including trees, hedgerows or scrub adjacent to, or within, the proposed development boundary) which is to be retained shall be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006), as follows:<br>• All trees along the Assessment Boundary that are to be retained, both within and adjacent to the Assessment Boundary (where the root protection area of the tree extends into the Assessment Boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist.<br>• Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it.<br>• The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10m of any retained trees, hedgerows and treelines:<br>• A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the Assessment Boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arboris.<br>• A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged. |

[4] A concrete product which is sprayed at high velocity into a rock face as a structural/stabilising component.

| Ref. No. | Stage | Commitments |
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| | | The planting and sowing scheme will not include non-native tree species.<br>Scots pine, which is invasive in heathland, will not be used for landscape planting west of the River Corrib. |
| 8.11 | C | The mitigation strategy outlined in the Non-Native Invasive Species Management Plan included in the CEMP (see Appendix A.7.5) will be implemented sufficiently far in advance of the proposed construction works commencing so as to allow time to adequately control all target non-native invasive species populations within the Zone of Influence (ZoI) of the Project, having regard to the specific timing/seasonal constraints that apply in relation to each individual species.<br>The Non-native Invasive Species Management Plan will direct the construction contractor in implementing the specific mitigation measures required in relation to individual non-native invasive plant species. |
| 8.12 | C | The implementation of the Non-Native Invasive Species Management Plan will include a pre-construction re-survey within the Assessment Boundary.<br>In accordance with the NRA guidance this survey will include accurate 1:5,000 scale mapping for the precise location of non-native invasive plant species. The pre-construction surveys will be undertaken by suitable experts with competence in identifying the species concerned. |
| 8.13 | C | In accordance with the Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (National Roads Authority, 2010), where cut, pulled or mown noxious weed or non-native invasive plant species material arises, its disposal will not lead to a risk of further spread of the plants. Care will be taken near watercourses as water is a fast medium for the dispersal of plant fragments and seeds. Material that contains flower heads or seeds will be disposed of either by composting or burial at a depth of no less than 0.5m in the case of noxious weeds, or by incineration (at a licenced facility having regard to relevant legislation) or disposal to licensed landfill in the case of non-native invasive plant species. |
| 8.14 | C | The taproots of docks and roots of creeping thistle are not suitable for composting or shallow burial, requiring disposal to landfill, incineration or burying at a depth of no less than 1.5m (practical only during the construction phase). Where burial is being used to dispose of Japanese knotweed, the material will be buried to a depth of 5m and overlain with a suitable geotextile membrane. All disposals will be carried out in accordance with the Waste Management Acts 1996 - 2024. |
| 8.15 | C | In relation to aquatic non-native invasive species all construction works, and any aquatic survey work that may be carried out (e.g. electrofishing), will comply with best practice biosecurity protocols for aquatic work – for example IFI's Biosecurity Protocol for Field Survey Work (IFI, 2010). |
| 8.16 | O | Areas of Annex I habitat within the Assessment Boundary which are identified to be retained and fenced off during the construction of the Project will also be avoided during the operational phase. |
| 8.17 | C/O | There will be no fencing within Annex I habitats that are located within Lough Corrib cSAC. |
| 8.18 | C/O | Areas of compensatory habitat will be created, managed and monitored as set out in the Compensatory Habitat Management Plan in Appendix A.8.27. ~~with locations of donor and receptors sites shown on Figures 1-9 in Appendix A.21.3 to this Schedule of Environmental Commitments (these figures are the final updated figures which replace, updated from the figures included in A.8.26 of the EIAR and those in Appendix B to the Biodiversity EIA Statement of Evidence of Aebhín Cawley presented at the oral hearing in 2020).~~ |
| 8.19 | C | Given the changing baseline environment, the CHMPs set out in Appendix A.8.27 of this updated EIAR are live documents which will need to be updated by the appointed contractor by way of pre-construction surveys.<br>The Ecology Site Management Plans, to be updated and finalised by the appointed contractor based on the detailed principles set out in this chapter and Appendix A.8.27, will set out the longer-term management regime for each of the habitats being translocated/created as part of the Project, for the lifetime of the Project.<br>Ecology Site Management Plans for compensatory habitats will be prepared by the contractor prior to the commencement of works, in accordance with the principles set out in Appendix A.8.27 of this updated EIAR.<br>In addition, the specific measures below will be incorporated into the Ecology Site Management Plans: ~~Given the changing baseline environment, the Compensatory Habitat Management Plans (CHMPs) set out in A.8.26 of this updated EIAR are live documents which will need to be updated by the appointed contractor by way of pre-construction surveys.~~<br>~~Ecology Site Management Plans for compensatory habitats will be prepared by the contractor prior to the commencement of works, in accordance with the principles set out in Appendix A.8.26 of the EIAR.~~ |

| Ref. No. | Stage | Commitments |
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| | | ~~In addition, the specific measures below will be incorporated into the Ecology Site Management Plans:~~<br>• Soils and plant material (including turves) from all 4030 donor sites will be the primary method used for dry heath habitat translocation and creation. The locations of all 4030 donor and receptor sites are presented in the Appendix A.8.27.<br>• Monitoring immediately after the turves are placed in the receptor sites will be undertaken every three weeks and after a heavy rainfall event until such time as the Dry heath is established, with an adaptive corrective plan put in place if evidence shows that it is not successful.<br>• A minimum 100m translocated soils/turve depth will be provided at each 4030 receptor site.<br>• The pH of the top 400mm layer of material in MDAs, where it directly underlies areas proposed for dry heath habitat creation, will be below 6.5.<br>• The preferred method of habitat translocation is for direct translocation of turves and soil/peat from donor to receptor sites. However, the construction phasing may not facilitate this in every instance. Where direct translocation of turves to receptor sites is not possible, they will be handled and stored based on documented best practice and proven case studies for peatland turve translocation which include:<br>– Ensuring turves are as large in size and depth as possible<br>– If necessary, use of specially designed digger buckets suitable for the purpose<br>– Use of low ground pressure vehicles for turve removal, especially for wetter donor sites such as the 4010 and *7130 donor sites, and if necessary operating on bog mats<br>– Storage of turves for the minimum time possible and placement at receptor sites at the earliest possible opportunity<br>– Storage of turves in a single layer to avoid crushing and to maintain their integrity<br>– Storage of turves on a flat surface placed on top of either a geotextile membrane, on bog mats or similar<br>– Regular watering (with rainwater) and monitoring of the turves for the duration of the storage time<br>– Storing turves end to end (i.e. with no gaps) to avoid edges drying out and if necessary using silt fencing or geotextile membranes along any vertical exposed edges of turves<br>• In the case of some of the dry heath receptor sites the nature of the ericaceous vegetation, shallow soils and outcropping granite, may make intact turve removal difficult. In these situations, trimming the ericaceous vegetation (and retaining this cut material for use as brash and a source of seed to assist in vegetation regeneration at the receptor sites) may assist in extracting intact turves. Where turves cannot be extracted intact in these areas then the scraw (mixture of soils, root stock, seed bank etc) will still be valuable for use as soils to be translocated to the receptor sites<br>• Similarly, where direct translocation of soil/peat to receptor sites is not possible, it will be handled and stored in the following manner to ensure it is protected:<br>– Use of low ground pressure vehicles for soil removal, especially for wetter donor sites such as the 4010 and *7130 donor sites, and if necessary operating on bog mats<br>– All wet peaty soils (e.g. this will be likely from the 4010 and *7130 donor sites) will be transported in sealed trucks to avoid loss of wet peat in transit<br>– Storage of soil/peat for the minimum time possible and placement at receptor sites at the earliest possible opportunity<br>– Storage of soils/peat from donor sites in dedicated area(s) within construction compounds for the Project west of the River Corrib, on top of a geotextile layer, no higher than 1.5m to avoid compaction<br>– Turves from donor sites will be ‘thatched’ on top of the stored soil/peat areas to seal and protect it for the duration of the storage period<br>• Turves will be placed end to end with no gaps. Where necessary receptor sites will be protected from erosion, and vegetation regeneration will be encouraged through the following means:<br>– Use of geocoir (on flat surface) or geojute (on sloped areas) on areas of bare soil, pinned down with 0.5m steel pegs or similar<br>– Spreading heather clippings which have been harvested from donor sites on bare soil<br>– Re-seeding, preferably with seeds collected from donor sites prior to turves/soil being removed, or if necessary with additional dry heath native seed material from a reputable supplier such as http://www.wildflowers.ie/. Where seeds are collected from donor sites prior to turves/soil being removed, they will be collected a minimum of one summer/autumn season prior to construction works commencing, during warm, dry conditions. Until such time as they are required to be planted at the receptor sites, seeds will be stored in suitable conditions |

| Ref. No. | Stage | Commitments |
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| | | to ensure their survival. These will be used for inclusion in the seed mix for planting later at the appropriate time of year at dry heath receptor sites.<br>• Minimising risks of erosion or escape of translocated soil/peat by:<br>– Undertaking all translocation works and handling of turves and soils/peats during dry weather conditions<br>– Undertaking these activities during dry conditions at the start of the vegetation growing season (i.e. spring) to encourage rapid establishment of plant growth prior to the winter season<br>– Implement the measures set out in the Sediment, Erosion and Pollution Control Plan (SEPCP) which summarises the procedures and technical practices for implementing effective sediment, erosion and pollution control through a variety of delivery methods for the construction phase of the Project is presented in Section 8 of the CEMP in Appendix A.7.5 of this updated EIAR and Appendix C of the updated NIS<br>– All wet peaty soils (e.g. this will be likely from the 4010 and *7130 donor sites) will be transported in sealed trucks to avoid loss of wet peat in transit<br>• The following measures will be implemented as part of the habitat translocation and creation measures to ensure that Daboecia cantabrica becomes established at the dry heath receptor sites:<br>– Seeds from mature plants of Daboecia cantabrica will be collected from the sites within the proposed development boundary where it has been recorded, from August/September onwards (in a year prior to construction works commencing), during warm, dry conditions. Seeds will be stored in suitable conditions to ensure their survival. These will be used for inclusion in the seed mix for planting later at the appropriate time of year at dry heath receptor sites<br>– Where it is possible to translocate turves from dry heath donor sites containing Daboecia cantabrica, all specimens Daboecia cantabrica will be located in the centre of turves to ensure their successful translocation<br>– All existing soils/peat at dry heath donor sites will be translocated for placement as the substrate at the dry heath receptor sites, thereby retaining the seedbank, including for Daboecia cantabrica, to allow natural regeneration of the species at the receptor site<br>– Heather clippings will be harvested at all dry heath donor sites and this material will include clippings from Daboecia cantabrica specimens<br>The calcareous grassland ecological recreation areas at Lackagh Quarry will be managed in perpetuity by GCC, are not accessible to the public and will be fenced off. There will be a minimum of two maintenance visits each year as set out in A.8.27 (Compensatory Habitat Management Plans) (CHMPs) of this updated EIAR. |
| **Measures to Reduce the Potential for Air Quality Impacts on biodiversity receptors** | | |
| 8.83 | C | To control dust emissions during construction works standard mitigation measures shall include: spraying of exposed earthwork activities and site haul roads during dry and/or windy conditions; provision of wheel washes at exit points; control of vehicle speeds and speed restrictions (20km/h on any un-surfaced site road); covering of haulage vehicles; and, sweeping of hard surface roads. These procedures will be strictly monitored and assessed on a daily basis.<br>Dust screens will be implemented at locations where there is the potential for air quality impacts during the construction phase i.e. at locations where sensitive receptors are located within 100m of the works.<br>In addition, a 2m dust screen will be provided at the locations in the areas of the overlap of the Project and the Lough Corrib SAC and adjacent to Moycullen Bogs NHA. |
| **Mitigation Measures to Reduce the Potential for Impacts to Water Quality in Receiving Watercourses** | | |
| 8.84 | C/O | To protect surface water during construction as per Chapter 11, Hydrology and the CEMP included in Appendix A.7.5 and in turn protect many of the biodiversity receptors. |
| **Measures to Protect Groundwater Quantity and Groundwater Quality and potential impacts on biodiversity receptors** | | |
| 8.85 | | To protect groundwater quantity and quality as per Chapter 10, Hydrogeology and the CEMP included in Appendix A.7.5 and in turn protect many of the biodiversity receptors.<br>Mitigation measures are included in Chapter 9, Soils and Geology to restrict the use of fill material in areas where there is the potential for run off/infiltration to affect pH levels in adjoining peatland habitats within the operational hydrogeological ZoI. |
| **Otters** | | |
| 8.20 | C | A pre-construction check of all suitable Otter habitat will be required within 12 months of any constructions works commencing. |

| Ref. No. | Stage | Commitments |
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| 8.21 | C/O | Safe passage will be ensured for otters along all watercourses bisected by the Project during construction and operation. Otter passage facilities will be provided at all watercourses bisected by the Project and used by Otter (e.g. raised ledges within structures, or separate dry 600mm pipes installed adjacent to culverts). Mammal underpasses will be constructed in accordance with the Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008c). The locations where Otter passage facilities will be provided are listed in Table 8.43 of Chapter 8, Biodiversity and shown on Figures 8.38.1 to 8.38.15.<br>The Otter passage facilities at structures C04/01 and C04/02, will comprise of a raised mammal ledge, sited above flood water levels, incorporated into the structure. |
| 8.22 | O | Mammal-resistant fencing will be installed in accordance with the specification outlined in Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008c) and TIIs mammal resistant fencing specification (currently CC-SCD-00320/00319). The locations where mammal-resistant fencing is to be installed are shown on Figures 8. 38.1 to 8. 38.15. |
| 8.23 | O | Quarterly monitoring of the effectiveness of the environmental commitments (for example, fencing inspections to check for gaps and underpass inspection to check for blockages, checking the effectiveness of the ledges installed in culverts) will be undertaken in the first three years after the completion of construction works and the maintenance of the ledges will be incorporated into the general road maintenance programme. |
| 8.72 | C | Mammal underpasses and Otter passage facilities will be checked and fully inspected before the relevant sections of the proposed N6 GCRR become operational ~~checked prior to the operation of the Project~~ to ensure they are constructed in accordance with the Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008c). |
| **Bats** | | |
| 8.24 | C | As the 2024 bat derogation licence expired on 31st December 2024, a new derogation licence application was submitted to the NPWS on 1 April 2025 (included in Appendix A.8.25 Part 2 of this updated EIAR). Derogation licences granted by the NPWS are published, along with the application and any supporting documentation, on their website at https://www.npws.ie/licensesandconsents/disturbance/application-for-derogation/bat-derogations-issued. **Please note, ABP will be able to see when the Bat Derogation Licence is granted, and obtain a copy of the final granted licence, by clicking on this link**. |
| 8.25 | C | The environmental commitments set out in the Bat Derogation Licence Application included in Appendix A.8.25 shall be adhered to by the Contractor. |
| 8.26 | O | The schedule of structures (culverts, underpasses and overpasses) to provide bat passage and the function that they serve in terms of mitigating the potential barrier effect are as per Table 8.42 of Chapter 8, Biodiversity and Figures 8.39.1 to 8.39.15.<br>In addition to these structures specifically designed for bat passage, there are other structures such as where minor roads pass underneath the Project which will be used by bats as safe crossing points. ~~The schedule of structures to provide bat passage and the function that they serve in terms of mitigating the potential barrier effect are as per Table 8.43 of Chapter 8, Biodiversity and Figures 8.23.1 to 8.23.15.~~ |
| 8.27 | O | The proposed overpass bridge at Castlegar is 30m wide. The overpass will be landscaped to provide a connective habitat across the Project. The overpass will be landscaped to provide a connective habitat across the Project. The proposed planting design associated with the Castlegar Wildlife Overpass comprises of a central narrow grass pathway bounded on either side by a double hedgerow (to mimic a 4m wide bóithrín); that is, 2m wide tree-lined hedgerows of native tree and shrub species. This planting will tie-in to proposed planting leading east and west along the upper slopes of both sides of the Project. Each of the hedgerows will then diverge out to create a “mouth” at the entrance to the overpass on both sides of the Project to funnel bats into the centre of the overpass. Soil depths will vary from a minimum of 45cm at the edges to 1.5m along the centreline. Tree species will be planted at 3m centres in double rows in each hedgerow and will include alder, birch, rowan, planted as standards (i.e. 8-10cm girth, c.2.4m high) and whips (1.25m high). Sixty percent of shrub planting will comprise blackthorn, hawthorn and hazel, augmented with elder, holly, spindle, willow etc. Hawthorn plants will be 90cm high. Other shrubs will be planted at 60cm high<br>~~The proposed planting design associated with the Castlegar Wildlife Overpass comprises of a central narrow grass path bounded on either side by a double hedgerow (to mimic a 4m wide bóithrín). Each of the hedgerows will then diverge out to create a “mouth" at the entrance to the overpass on both sides of the proposed road development to funnel bats in to the centre of the overpass. Planting to tie-in to proposed planting leading east and west on upper slopes of cuttings on both sides of the proposed N6 GCRR.~~ Plate 8.3, of Chapter 8, Biodiversity, shows the schematic design and location of the proposed overpass. |

| Ref. No. | Stage | Commitments |
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| 8.28 | O | No lighting will be provided at or on any of the structures which have been designed to provide bat passage, with the exception of S06/01 where lighting will be provided to also allow for safe use by pedestrians. All of the bat underpasses (as well as artificial roosts) that are designed for Lesser horseshoe bats will have connecting woody vegetation features. Other bats species are not as reliant on hedgerows and woodland edges. Whilst there are many existing landscape features outside of the Assessment Boundary, the bat mitigation strategy cannot rely on these in the long term as they may be subject to interventions by third parties. In effect, what will be created is a hedgerow corridor leading up to underpasses in the section of the Project between Aughnacurra and Castlegar. This planting provides a guaranteed green corridor connecting up the underpasses/overpasses and will allow bats to adapt more easily to any future landscape scale losses of connecting habitat features that may occur. The hedgerow planting leading up to underpasses will be maintained and the growth of the hedgerow monitored for 5 years following completion and remediation works undertaken if deemed necessary. |
| 8.29 | C | As the baseline level of bat activity and roost occupancy can change over time, pre-construction monitoring will be carried out in advance of construction works commencing to ensure that the data against which the post-construction monitoring will be compared to is as up-to-date as possible (refer to Bat Derogation Licence included in Appendix A.8.25). Pre-construction monitoring will be as detailed in Section 8.6.5.2 of Chapter 8, Biodiversity, and include:<br>• Occupancy levels in roosts (Menlo Castle, proposed artificial roost buildings including retrofitted retained buildings, bat boxes)<br>• Bat passage structures (culverts, underpasses and the Castlegar Wildlife Overpass)<br>• Diversity of bat species and abundance of bat activity adjacent to the Project<br>Monitoring of the effectiveness of the bat mitigation and compensation measures will also be undertaken during and post-construction. Monitoring will be as detailed in Section 8.6.5.2 of Chapter 8, Biodiversity, and include:<br>• Roost monitoring<br>• Monitoring at cross points<br>• Transect monitoring for diversity and abundance adjacent to the proposed N6 GCRR corridor<br>Where the monitoring identifies issues with either the mitigation or compensation measures (e.g. light spill affecting usage), these will be remediated to ensure that those measures will achieve their aims with respect to mitigating or compensating for impacts on the local bat populations (refer to Bat Derogation Licence included in Appendix A.8.25). |
| 8.73 | C | The structures provided for the passage of bats will be checked prior to the operation of the Project to ensure they are constructed in accordance with the design requirements set out in Section 8.6.5.2 and Section 8.9.2 of this updated EIAR. |
| 8.75 | C | The following shall apply for structures either confirmed as supporting bat roosts or considered to have the potential to support roosting bats:<br>• Prior to demolition of the 19 structures containing confirmed bat roosts, replacement artificial roosts will be in place to ensure that bats are able to access alternative resting places at the earliest opportunity<br>• Where possible, buildings with the confirmed bat roosts will not be demolished during the breeding period or hibernation period (April to mid-August and November-March) as the risk of accidental death or injury is higher at this time. Bats may use roosts in smaller numbers in winter but may nevertheless be present. Outside of these periods, the approach to demolition of bat roosts will be determined on a case-by-case basis and subject to relevant licence conditions.<br>• Buildings confirmed as bat roosts proposed for demolition will be marked on the ground with agreed paint marking to permit identification by Contractors<br>• Prior to demolitions, all structures that were confirmed as either having bats or having high suitability for bats will be re-examined immediately prior to demolition to assess whether bats are present at the time of demolition. This will be an all-night examination to determine if bats enter the building during the night or early morning. This will provide adequate information to proceed with demolitions unless weather conditions were unsuitable for feeding bats. If bats are present, they will require exclusion from the property over several nights or if possible physical removal by hand by a licenced bat specialist to be placed in a bat box or similar for release in the evening after capture. For structures which have not been confirmed as bat roosts but regarded to have high suitability for bats and due for demolition, a bat detector assessment of the property to be demolished will be carried out, (note demolitions will not be permitted during the period May to August (the breeding period) in the case of the confirmed bat roosts, as the risk of accidental death or injury to bats is too great at this time). This will be an all-night examination to determine if bats enter the building during the night or early morning. This will provide adequate information to proceed with demolition unless weather conditions were unsuitable for feeding bats. If bats are present, then they will require exclusion from the property over several nights or |

| Ref. No. | Stage | Commitments |
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| | | if possible physical removal by hand by a licenced bat specialist to be placed in a bat box or similar for release in the evening after capture<br>• Once structures containing roosts are deemed to be clear of bats, the bat specialist will be on site to supervise the demolition procedure until the structure is no longer deemed able to support a bat roost. Bats may re-enter a partially demolished structure overnight so the bat specialist may be required to be present during demolition works until they are completed. |
| 8.76 | C | The following shall apply for trees identified as having high suitability to support roosting bats (locations indicated in Figures 8.25.1 to 8.25.15 and Figures 8.26.1 to 8.26.15). These include the three trees confirmed to have had bats present (PTR43, PTR48, and PTR45) and the 13 other trees to have high suitability, where either obvious potential roosting features are present, or where obscured by dense ivy cover, the tree is of an age and condition that there is a high chance that roosting features are present.<br>• Felling of confirmed and potential tree roosts will be undertaken during the period September – October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding or in hibernation<br>• Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using night vision aids such as infrared or thermal imaging cameras and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present<br>• Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of c.30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist<br>• Trees should only be felled "in section" or "soft felled" where the sections can be rigged to avoid sudden movements or jarring of the sections<br>• Where remedial works (e.g. pruning of limbs) are to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using endoscope, where applicable and necessary) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture<br>• Prior to felling the three confirmed tree roosts (PTR43, PTR48, PTR45), and any other trees with potential for a bat roost, at least two replacement bat boxes will be installed on trees, as close to each felled tree as possible (ss per ABP's Inspector's report dated June 2021), with potential for a bat roost, as close as possible but away from the carriageway of the proposed road and before the end of July in the year of felling. These boxes will be a mixture of hollow (for Leisler's) and crevice types (for pipistrelles) in accordance with the potential roost that is lost. The location of the bat boxes in these instances will be within the Assessment Boundary but will be decided by the bat specialist. Where a suitable tree cannot be identified in close proximity to a known bat tree roost / potential bat tree roost, the next most suitable tree, within the Assessment Boundary, in an appropriate location (i.e. avoiding the roadside) will be selected by the bat specialist. |
| 8.77 | C | Any existing features that are identified as preferred crossing points and are scheduled for removal will be retained until the last moment and a portable artificial crossing structure put alongside it prior to its removal, so at no stage there is a gap across the construction site at night. The use of the temporary fence as an artificial crossing structure will be monitored three times over two weeks following installation. If the artificial crossing structure is not at the same location as a proposed permanent crossing point (e.g. the wildlife overpass at Castlegar) then it shall be moved gradually over several nights to realign it with the permanent crossing point. |
| 8.86 | C | No artificial lighting will be used at any watercourse crossings during construction to ensure that bats are not displaced or prevented from using the riparian corridors for commuting or foraging. |
| **Badgers** | | |
| 8.30 | C | A detailed summary of the environmental commitments as they relate to each of the Badger setts within the ZoI of the Project is presented in Appendix A.8.26.<br>The non-interference zones (30m, 50m, and 150m) as they relate to each of the Badger setts within the ZoI of the Project are illustrated on Figures 8.38.1 to 8.38.15.<br>A pre-construction check of the activity status of all setts will be required within 12 months of any constructions works commencing within the ZoI of the setts discussed below. |
| 8.31 | C | In order to prevent any disturbance to Badger setts not directly affected by the Project:<br>• No heavy machinery shall be used within 30m of Badger setts at any time |

| Ref. No. | Stage | Commitments |
|---|---|---|
| | | • No works shall be undertaken within 50m of active setts during the breeding season (December to June inclusive)<br>• Lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance<br>• Neither blasting nor pile driving shall be undertaken within 150m of active setts during the breeding season (December to June inclusive) |
| 8.32 | C | Prior to works commencing, a non-interference zone of 30m will be established around each of the Badger setts within the ZoI of the Project, as shown Figures 8.38.1 to 8.38.15. If the sett is active, non-interference zone will be extended to 50m during the breeding season (December to June inclusive). The fencing shall be as noted in Chapter 7, Construction Activities of a sufficient durability to maintain the exclusion zone throughout the construction period or, if required, until such time as the sett in question is excluded/removed. |
| 8.33 | C | Where setts require exclusion and removal, or temporary exclusion for the duration of the construction period, this will be undertaken in accordance with the methodology detailed in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (National Roads Authority, 2006a):<br>• All Badger setts requiring exclusion and removal will require a monitoring period of at least five days to confirm activity status in advance of any construction works commencing.<br>• If the sett is active, then it shall not be removed within the Badger breeding season (December to June inclusive). To exclude or remove an active Badger sett outside of this period, inactive entrances shall be soft and hard-blocked with one-way gates installed on active entrances. One-way gates will be tied open for three days before being set to exclude, and then monitored for a period of at least 21 days before the sett is deemed inactive and destroyed.<br>• If at any time during the monitoring period the sett becomes active, the exclusion process/programme must commence again from day 1 of the 21-day monitoring period.<br>• For inactive setts, entrances will be soft-blocked (lightly blocked with vegetation and soil) and if all entrances remain undisturbed for a period of five days the sett should be destroyed immediately. This can be undertaken at any time of the year for inactive setts. |
| 8.34 | C | An artificial sett is required to mitigate for the loss of the main sett (S9), in conjunction with a subsidiary sett (S11), of the Lackagh Badger group. The requirements relating to the provision and design of the artificial sett are set out in Appendix A.8.26. The location of the artificial sett is shown on Figures 8.38.1 to 8.38.15. |
| 8.35 | C | Inaccessible areas (see Figures 8.4.1 to 8.4.15 and Figures 8.5.1 to 8.5.15) will require a pre-works survey for badger setts in advance of site clearance. If a sett is uncovered, works must cease and a non-interference zone of 30m established; extended to 50m during the breeding season if set is active (December to June inclusive). Sett removal will follow the process outlined above. |
| 8.36 | O | To avoid badger road casualties, mammal passage facilities will be provided at strategic locations along the route of the Project. Mammal underpasses will be constructed in accordance with the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (National Roads Authority, 2006a). Mammal underpasses will extend as far as, and integrate with, the mammal resistant fencing<br>Where engineering constraints conflict with the recommended locations at detailed design phase, mammal underpasses may be moved to the nearest most suitable location, but not more than c.250m away. The locations where Badger passage facilities will be provided are listed in Table 8.43 and are shown on Figures 8.38.1 to 8.38.15. |
| 8.37 | O | A number of the mammal passage structures lie within the modelled light spill zone and artificial lighting may affect their usage by Badger: structures C07/04, C07/01(b) and C12/01. Screening will be provided to ensure that the approaches and entrances to these structures are unaffected by light spill. |
| 8.38 | O | Mammal-resistant fencing will be required to guide badgers to the underpasses and will be installed in accordance with the specification outlined in Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (National Roads Authority, 2006a),, and TIIs mammal resistant fencing specification (currently CC-SCD-00320/00319), and will include badger proofing of emergency access roads and other similar access points, where located in areas where mammal-resistant fencing is to be installed. The locations where mammal-resistant fencing is to be installed are shown on Figures 8.38.1 to 8.38.15. This includes mammal proofing the paladin security fencing proposed around all attenuation ponds/water ponds. |
| 8.39 | O | In accordance with the recommendations described in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (National Roads Authority, 2006a), quarterly monitoring of the effectiveness of the environmental commitments will be undertaken in the first three years after the completion of construction works (for example, fencing inspections to check for gaps and underpass inspection to check for blockages, checking the effectiveness of the ledges |

| Ref. No. | Stage | Commitments |
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| | | installed in culverts). Also, given the scale of the project, monitoring will continue for at least three years and the maintenance of the ledges will be incorporated into the general road maintenance programme. |
| 8.74 | C | Badger passage facilities will be checked prior to the operation of the Project to ensure they are constructed in accordance with the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (National Roads Authority, 2006a). |
| **Other mammal species (excluding bats)** | | |
| 8.40 | O | The schedule of structures to provide for mammal passage, as per Table 8.43 and as shown on Figures 8.38.1 to 8.38.14, are required to ensure permeability for all other mammal species across the Project during operation. |
| **Invertebrates** | | |
| 8.41 | C | To avoid the destruction of Marsh fritillary eggs or the mortality of Marsh fritillary caterpillars, the following mitigation strategy will be implemented in relation to the site clearance works:<br>• All areas within the proposed development boundary, which have been identified as suitable habitat to support the Marsh fritillary butterfly, will be subject to a pre-construction larval web survey. This will be undertaken during the mid-August to the end of September window immediately preceding site clearance works.<br>• If larval webs are present, they will be translocated to another area of suitable habitat; either outside of the Assessment Boundary or, if within, to an area of suitable habitat that will remain unaffected by construction works for the duration. Sufficient suitable Marsh fritillary butterfly habitat exists locally that is in a good or optimal condition for a period long enough to allow translocated larval webs to complete their life-cycle.<br>• If larval webs are present, the larval webs will be moved by translocating vegetation turves which contain the host plant species (Succisa pratensis) with larval webs present<br>• The vegetation turves will be moved to the receptor site(s) immediately following excavation to ensure they do not dry out. The translocated turves will be set into existing vegetation immediately adjacent to the area of Molinia meadow and/or Wet heath habitat being retained (locations described below) and will be fenced off to prevent any accidental damage from construction works. Care will be taken to ensure that any specimens of Succisa pratensis with larval webs present will be at the centre of the turves. Turves will be fully bedded in at the receptor site(s) to ensure there are no exposed edges vulnerable to drying out.<br>• Four locations within the Assessment Boundary that are suitable receptor sites. The first location is at Ch. 0+900, an area of wet grassland (GS4)/Annex I Molinia meadow [6410] habitat that is being retained within the proposed development boundary (Figure 8.38.1 of this updated EIAR). The second location is at is at Ch. 3+000, a mosaic of Annex I Wet heath [4010], wet grassland (GS4) and Annex I Dry heath [4030] habitat that is being retained within the proposed development boundary (Figure 8.38.3 of this updated EIAR). The third location is at is at Ch. 3+000 of the proposed N6 GCRR, a mosaic of Annex I Wet heath [4010], wet grassland (GS4) and Annex I Dry heath [4030] habitat that is being retained within the Assessment Boundary (Figure 8.38.3). The fourth location is between Ch. 12+20 and Ch. 12+400 of the proposed N6 GCRR, an area of wet grassland (GS4)/Annex I Molinia Meadows [6410] habitat that is being retained within the Assessment Boundary (Figure 8.38.9).<br>• Once all larval webs have been removed from the affected areas, or if no larval webs were recorded, the vegetation will be immediately cleared or cut to ground level to render the area unsuitable for the species to recolonise. The vegetation shall be maintained in this state until such time as the topsoil is removed. |
| **Birds** | | |
| 8.42 | C | Where feasible, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1 March and the 31 August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required. |
| 8.43 | O | Planting of woodland, hedgerow and grassland habitats along the Project as detailed in the landscape drawings (Figures 12.2.01 to 12.2.15) will provide compensatory habitat for some bird species. |
| 8.44 | O | To further minimise the effects of breeding habitat loss, a total of 20 nest boxes will be erected by an ecologist in suitable locations away from the busy junctions/roadways. The siting and type of nest boxes will be decided on by an ecologist at locations where trees will be planted or retained along the Project; as shown on Figures 12.2.01 to 12.2.15. |

| Ref. No. | Stage | Commitments |
|---|---|---|
| | | Nest boxes will be monitored annually by an ecologist, and the results reported to Galway County Council, to record their usage by breeding birds for a period of three years post-construction. |
| 8.87 | C/O | To minimise the potential for construction works to affect the nest site at Menlo Castle, all works which have the potential to cause disturbance will be undertaken outside of the Barn owl breeding season (i.e. when there is no breeding activity at the nest site). The Barn owl breeding season is typically from February to July, but can extend into October/November.<br>Based on the specifics of the nature, scale and proximity of the Project to the nest site, the disturbance free zone (i.e. exclusion buffer) will be a minimum of 150m from the nest site during the Barn owl breeding season. Construction works can be carried out outside of this zone at any time of the year as this will not constitute a disturbance to the breeding pair or nest site. Construction works must only be carried out in proximity to the nest (i.e. within the defined disturbance free zone) when it is confirmed that there is no breeding activity at the nest, which is typically during the months of September to February. However, the breeding status at this site must be assessed by a Barn owl specialist in advance of the commencement of works (within the defined disturbance free zone) to determine breeding activity at the time as Barn owls can breed at any time of the year.<br>If any potentially suitable Barn owl sites are to be directly affected or lie within 175m of the Project by the construction of the Project (including enabling or site investigation works such as ground investigations), a Pre-Construction survey will be undertaken according to the methods as outlined in the Survey and Mitigation Standards for Barn owls to inform the Planning, Construction and Operation of National Road Projects (TII, 2021).<br>The purpose of the pre-construction survey is to determine Barn owl occupancy and breeding status at a site in advance of the initiation of works, where the construction activities could cause disturbance to a breeding pair, if present. The timing of works will be planned to avoid the main nesting period of Barn owls so that the potential of breeding activity at these sites is considered low. A single visit, according to best practice methods is usually sufficient to determine breeding status. The Pre-Construction survey must be carried out in advance of but in the same year (and timed accordingly to determine breeding activity at a particular time in that year). If breeding activity is recorded, then works which would cause disturbance or negatively impact a site or breeding attempt must not be carried out until after the breeding season (which should be assessed by the Barn owl Specialist). If no breeding activity is recorded, then works can proceed. Barn owls can use sites (particularly buildings) throughout the year and may be present outside of the breeding season, however, if it is confirmed that there is no breeding activity then works can continue.<br>Barn owl mitigation measures will be integrated into the landscape design in proximity to, and within a 5km zone surrounding, the breeding site at Menlo Castle, where these measures do not conflict with other landscape and safety requirements and other environmental considerations of the road design. |
| 8.45 | C | To minimise the effects of current levels of disturbance to the Barn owl nest site at Menlo Castle, and thereby reduce any cumulative effect that construction activities nearby may have, alternative nesting sites will be provided in the vicinity. Three Barn owl nest boxes will be erected across the area shown on Figures 8.38.1 to 8.38.15 and will consist of either nest boxes erected on suitable trees or pole-mounted nest boxes. Preference will be given to erecting nest boxes on suitable trees, where possible.<br>Tree mounted boxes will be erected at least 3m above ground level on a mature tree with few or no low branches to obscure the nest box. The selected tree shall be either isolated in a hedgerow or situated on a woodland edge with the access hole facing open ground.<br>Pole-mounted nest boxes will be erected at a minimum height of 4.5m above ground. The nest box design (e.g. entrance hole size, floor area and depth from bottom of entrance hole to nest) shall be in accordance with the design requirements published by The Barn Owl Trust (http://www.barnowltrust.org.uk/). Nest boxes will be inspected annually for defects/damage and cleaned out/repaired as required to ensure waterproofness and the internal box depth. |
| 8.89 | | Barn owl mitigation measures will be integrated into the landscape design in proximity to, and within a 5km zone surrounding, the breeding site at Menlo Castle, where these measures do not conflict with other landscape and safety requirements and other environmental considerations of the road design.<br>The immediate roadside verge will be created or maintained as unsuitable foraging conditions to discourage Barn owls from hunting in this area to reduce risk of direct vehicle collision and/or birds becoming caught in the wake of a Heavy Commercial Vehicle (HCV). Within 3m of the road edge immediately adjacent to the hard shoulder/carriageway (in the absence of a hard shoulder), the grass will be maintained to a height not exceeding 10cm or replaced with gravel if appropriate (noting that gravel would generally be considered inappropriate unless there are issues for access for maintenance, or aesthetic considerations at feature areas, such as roundabouts or entrances to towns). |

| Ref. No. | Stage | Commitments |
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| | | If possible and suitable to the existing surrounding landscape, a natural barrier of dense shrub and/or tree line will be provided in the wider verge adjacent to the immediate roadside verge to serve as buffer. |
| 8.46 | O | Sections along the Project will be planted with dense low growing scrub cover (e.g. blackthorn) to discourage Barn owls from foraging near the Project. The planting will be of a density to minimise the lag time between planting and obtaining sufficient ground cover to deter foraging Barn owl. |
| 8.47 | O | In areas where there is a high probability that Barn owls may regularly attempt to cross the Project (the section of embankment between Ch. 9+600 and Ch. 10+100), lines of closely spaced (approximately 2m centres) trees, greater than 3m in height, will be planted along the top of the embankments of the Project; outside of the safety barrier and clear zone. The understorey will also be densely planted. This is to present a solid vegetated barrier to deflect Barn owl from these high-risk areas and/or force birds to fly over the Project above the road traffic.<br>In other locations along the Project, where there are areas of suitable barn owl habitat being created or retained, a 2m wide belt of shrubs and trees that will reach a minimum of 4m in height will also be planted to discourage Barn owl from accessing the road carriageway. |
| 8.48 | O | All mitigatory planting will be in place at the earliest feasible stage during construction to ensure that the mitigation is functioning as soon as possible. The locations where planting will be used to reduce the risk of Barn owl mortality from road traffic are shown on Figures 8.38.1 to 8.38.15 and on the landscape drawings (Figures 12.2.01 to 12.2.15). |
| 8.90 | C | To establish and maintain rough grassland habitat for barn owl, lands covering an area of *c*.8.9 ha to the northwest of the Project at Menlo Castle (see Figure 8.38.1 to 8.38.15) will be grazed annually by cattle for a three-month period between July and October at a stocking rate of 0.35 livestock units/ha. The strategy, and prescribed stocking density, follows that used by the Barn Owl Conservation Trust at their Nature Reserve in the UK, as detailed in the *Barn Owl Conservation Handbook* (Barn Owl Trust, 2012).<br>Annual monitoring of the grassland habitat will be undertaken for a period of 5 years post-implementation with the objective of recording the establishment of suitable rough grassland habitat and adjustment of the stocking density, if required. |
| 8.53 | O | Following implementation of all environmental commitments for Barn Owls and completion of construction of the Project, the following monitoring measures are proposed:<br>• Surveys will be undertaken of roadside planting schemes at the end of years one and two with the objective of identifying and replacing failed plantings.<br>• A road casualty survey to record barn owl mortalities along the route of the proposed Project will be conducted following that approach set out in REENV-07004 T*he interactions between Barn owls and major roads: informing management and mitigation* (Lusby *et al*., 2021) for a period of two years post-opening ~~development will be conducted once per week for a period of two years by a suitably qualified and experienced ornithologist. The Project will be driven at a steady pace in both directions so that all sections and both sides of the route will be covered. Where noted, all barn owl mortalities will be assigned to either the "breeding" season (March to July) or "non-breeding" season (August to January). Location details of the casualty will be recorded, including a 10-digit GPS co-ordinate, position on the route (central median, hard shoulder, or verge) and orientation (southbound, northbound, eastbound, and westbound). The age class of the bird will be determined and classed as either "pre-breeding" if first or second calendar year recovered before March, or "adult" if the bird is second calendar year recovered later than March or older. The adjacent habitat feature will be noted. This methodology is in line with that utilised for Barn Owl population status and the extent of road mortalities in relation to the Tralee Bypass (O'Clery et al., 2016).~~<br>• Monitoring to determine activity and breeding status of all active sites within 5km of the Project over two breeding seasons (March to July). This will be carried out concurrently with the road casualty survey, and will involve visits to known and potential nesting sites to determine brood size and breeding success. Where accessible, nests will be visited in order to ring owlets (subject to an appropriate licence from the NPWS).<br>A report summarising the findings of the above monitoring will be submitted at the end of year two to the NPWS. The report may include further recommendations pending survey outcomes. |
| 8.54 | C | Both of the former Peregrine falcon nest sites in the north east corner of Lackagh Quarry will be retained. The precise locations have not been divulged in this updated EIAR due to the risk of persecution to the species. Galway County Council and/or BirdWatch will need to be consulted to ascertain their precise locations to ensure their retention and protection from works.<br>To minimise the potential for construction works near Lackagh Quarry to disturb the Peregrine falcon nest site, works from the Lackagh Tunnel to the N84 Headford Road Junction will commence prior to mid-February. |

| Ref. No. | Stage | Commitments |
|---|---|---|
| | | Rock-bolts will not be installed in the immediate vicinity of an active peregrine falcon nest site during the breeding bird season (1 March to 31 August).<br>An alternative nest site for Peregrine falcon will be provided on Galway City Council owned lands to the south-east of Lackagh Quarry as indicated on drawing GCRR-SK-PP-067 (Appendix A.21.5 of this Schedule of Environmental Commitments). This artificial nest site will be in place prior to the commencement of works which have the potential to disturb or displace breeding Peregrine falcon in Lackagh Quarry. The alternative nest site will be provided in accordance with the design requirements set out in the report prepared by BirdWatch Ireland contained in Appendix A.21.6 of this Schedule of Environmental Commitments.<br>An artificial peregrine falcon nest box will be installed at each of the two former nest sites in Lackagh Quarry. Remediation works will be carried out at the two ledges to create a level and stable substrate for the nest boxes. The artificial nest boxes will be securely anchored to the cliff face at each location and will be provided in accordance with the design requirements set out in the report prepared by BirdWatch Ireland, the relevant extract from which is contained in Appendix A to this Schedule of Environmental Commitments.<br>Monitoring of Peregrine falcon breeding activity at both Lackagh Quarry and the proposed alternative nest site will be undertaken throughout each breeding season over the entire construction period to ascertain any nest success/failure of the local breeding pair and if blasting is affecting numbers of common Peregrine falcon prey species. Use of the artificial nest sites will also be monitored during operation of the proposed N6 GCRR for a period of three years. |
| 8.55 | C | Construction noise will be kept to a minimum in accordance with BS 5228 (2009). |
| 8.56 | C | Blasting associated with the eastern approach to Lackagh Quarry (Ch. 11+800 to Ch. 12+100) will be carried out between the months of April to September (inclusive) to minimise the exposure of wintering birds at Ballindooley Lough to blasting-related disturbance. |
| 8.57 | C | Blasting associated with the cutting at Castlegar (Ch. 12+550 to Ch. 13+650) will take approximately nine months to complete, with an estimated five blast events per week. To minimise the exposure of wintering birds at Ballindooley Lough to blasting-related disturbance, all of those nine months must be in the April to September period (inclusive) within consecutive years. |
| 8.50 | O | Nest boxes will be monitored annually by an ecologist, and the results reported to Galway County Council, to record their usage by breeding birds for a period of three years post-construction. |
| 8.78 | C | To minimise the potential for construction works to affect the nest site at Menlo Castle, all works which have the potential to cause disturbance will be undertaken outside of the Barn owl breeding season (i.e. when there is no breeding activity at the nest site). The Barn owl breeding season is typically from February to July, but can extend into October/November.<br>Based on the specifics of the nature, scale and proximity of the Project to the nest site, the disturbance free zone (i.e. exclusion buffer) will be a minimum of 150m from the nest site during the Barn owl breeding season. Construction works can be carried out outside of this zone at any time of the year as this will not constitute a disturbance to the breeding pair or nest site. Construction works must only be carried out in proximity to the nest (i.e. within the defined disturbance free zone) when it is confirmed that there is no breeding activity at the nest, which is typically during the months of September to February. However, the breeding status at this site must be assessed by a Barn owl specialist in advance of the commencement of works (within the defined disturbance free zone) to determine breeding activity at the time as Barn owls can breed at any time of the year. |
| 8.79 | C | If any potentially suitable Barn owl sites are to be directly affected or lie within 175m of the Project by the construction of the Project (including enabling or site investigation works such as ground investigations), a Pre-Construction survey will be undertaken according to the methods as outlined in the Survey and Mitigation Standards for Barn owls to inform the Planning, Construction and Operation of National Road Projects (TII, 2021).<br>The timing of works will be planned to avoid the main nesting period of Barn owls so that the potential of breeding activity at these sites is considered low. A single visit, according to best practice methods is usually sufficient to determine breeding status. The Pre-Construction survey must be carried out in advance of but in the same year (and timed accordingly to determine breeding activity at a particular time in that year). If breeding activity is recorded, then works which would cause disturbance or negatively impact a site or breeding attempt must not be carried out until after the breeding season (which should be assessed by the Barn owl Specialist). If no breeding activity is recorded, then works can proceed. Barn owls can use sites (particularly buildings) throughout the year and may be present outside of the breeding season, however, if it is confirmed that there is no breeding activity then works can continue. |
| **Amphibians** | | |
| 8.58 | C | If works to clear any of the habitat features suitable to support amphibian species are to begin during the season where frogspawn or tadpoles may be present (February – mid-summer), or where |

| Ref. No. | Stage | Commitments |
|---|---|---|
| | | breeding adult newts, their eggs or larvae may be present (mid-March – September), a pre-construction survey will be undertaken to determine whether breeding amphibians are present. |
| 8.59 | C | In the case of Common frog, any frog spawn, tadpoles, juvenile or adult frogs present will be captured removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat, beyond the ZoI of the Project. |
| 8.60 | C | In the case of Smooth newt, individuals will be captured and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of available suitable habitat, beyond the ZoI of the Project. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating Smooth nest. |
| 8.61 | C | If the size or depth of the habitat feature is such that it cannot be determined whether all amphibians have been captured, it will be drained under the supervision of a suitably experienced ecologist to confirm that no amphibian species remain before it is destroyed or infilled. Any mechanical pumps used to drain the habitat feature will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism. |
| 8.62 | C | Any capture and translocation works shall be undertaken immediately in advance of site clearance/construction works commencing. |
| 8.63 | O | The schedule of structures to provide for mammal passage, as per Table 8.43 and as shown on Figures 8. 38.1 to 8.38.15, are required to ensure permeability for amphibian species across the Project during operation. Where structures for mammal passage occur in close proximity to ponds or wetlands, structures, such as earth banks, will be included to guide amphibians to those crossing structures (as per ABP's Inspector's Report dated 22 June 2021). |
| **Reptiles** | | |
| 8.64 | C | In order to minimise the risk of site clearance and construction works disturbing, or causing the mortality of, Common lizard the following schedule of site clearance works will be followed in the areas highlighted on Figures 8.14.1 to 8.14.8 and Figures 8.15.1 to 8.15.8, where the presence of Common lizard has been confirmed:<br>• Grass, scrub or heath vegetation will be removed during the winter period, where possible, avoiding potential Common lizard hibernacula sites (dry sites which provide frost-free conditions e.g. stone walls, underground small mammal burrows, piles of dead wood or rubble).<br>• Where this is not possible and clearance will be undertaken during the active season (March through to September, inclusive), vegetation will be cut first to approximately 15cm, and then to the ground, under supervision of an ecologist. This will allow the opportunity for lizards to be displaced by the disturbance and leave the affected area.<br>• Stone walls (or other potential hibernacula sites) will be removed during the active season (March through to September, inclusive) under the supervision of an ecologist, when they are less likely to be in use by torpid lizards. |
| 8.65 | O | The schedule of structures to provide for mammal passage, as per Table 8.43 and as shown on Figures 8.38.1 to 8.38.15, are of a size that are likely to be used by Common lizard and will, therefore, ensure permeability for the Common lizard across the proposed N6 GCRR during operation. |
| **Fish** | | |
| 8.66 | C | To minimise the effects of habitat loss on fish species, all sections of river/stream channel within the Assessment Boundary, but not within the footprint of the Project and associated infrastructure, will be protected from site clearance and construction works. Rivers/streams will be fenced off at a minimum distance of 5m from the river bank and within this zone the natural riparian vegetation will be retained. |
| 8.67 | C | To minimise the potential effects of construction works on fish species the following environmental commitments will be implemented:<br>• No instream works will be carried out between the months of October and June (inclusive) to avoid the most sensitive time for fish species and fish species movements.<br>• Design of new sections of river channel shall be in accordance with the principles outlined in Channels & Challenges. Enhancing Salmonid Rivers. (O'Grady, 2006).<br>• Immediately prior to rivers/streams being diverted into a newly constructed river channel or culvert, they will be electrofished (if required) to capture and transfer fish from the original channel to the new one. Once the watercourse has been diverted this will be followed by a manual search of the original watercourse to transfer any remaining fish to the new river/stream channel). |

| Ref. No. | Stage | Commitments |
|---|---|---|
| | | • Any water abstraction points required for dust suppression will be agreed with IFI and the suction head shall be screened to ensure that fish are removed during the abstraction process. |
| 8.68 | C | All temporary crossing structures used to cross watercourses during construction will be designed in accordance with the Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016) and Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (National Roads Authority, 2005) to maintain fish and macroinvertebrate passage, and to prevent sedimentation and erosion. |
| **Rare and protected plant species** | | |
| 8.80 | C | The extent of the following plant species will be recorded and mapped, pre-construction, to ensure impacts to local populations are minimised and, where retained, are safeguarded by use of fencing, signs and ensuring workforce are aware (toolbox talks, etc) of the locations:<br>• Woodsy thyme moss *Plagiomnium cuspidatum*<br>• Lesser striated feather-moss *Plasteurhynchium striatulum*<br>• Imbricate bog-moss *Sphagnum affine*<br>• Red bog-moss Sphagnum *capillifolium s. capillifolium*<br>• Spring gentian *Gentiana verna*<br>• Eyebright *Euphrasia arctica* |
| 8.81 | C/O | Where Plagiomnium cuspidatum and Plasteurhynchium striatulum plants are directly impacted and are growing on moveable substrates (rocks or logs) then the substrates will be relocated to areas of retained vegetation, with precisely the same environmental conditions as the donor site, with follow-up monitoring to confirm success or failure.<br>Additionally, some populations of these plant species will be retained within the areas of habitat to be retained (Section 8.6.3.1 of Chapter 8, Biodiversity). |
| 8.82 | C | Pre-construction, check the identification and native status of meadow oat-grass Helictotrichion pratense and marsh valerian Valeriana dioica and implement protection measures, if appropriate.<br>Where grassland seeding will be used, it will be suitable for the soil types and avoid negative indicator species for grassland Annex I habitats, aiming for dry heath/acid grassland to the west of the River Corrib and calcareous grassland to the east of the River Corrib. Grassland habitat creation approaches will favour natural regeneration rather than the use of seed mixes, wherever soil erosion is not a major risk. |