16 Schedule of Mitigation

16.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the aspects of the receiving environment, grouped under the following headings:

- Population & Human Health
- Biodiversity
- Lands, Soils & Geology
- Hydrology & Hydrogeology
- Air, Odour & Climate
- Noise & Vibration
- Landscape & Visual
- Traffic & Transportation
- Archaeology & Cultural Heritage
- Material Assets

Annex IV(7) of the EIA Directive, as amended, requires that the EIAR should include '*a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases"*.

The Proposed Development will be constructed and operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. Where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance.

This Chapter of the EIAR collates and summarises the mitigation and monitoring measures detailed in **Chapter 5.0** to **Chapter 14.0.**

Mitigation and monitoring measures proposed during the construction phase are outlined in **Table 16.1**, and measures proposed during the operational phase are presented in **Table 16.2** below.

16.2 Construction Phase

Table 16.1: Mitigation and monitoring (Construction Phase)

EIAR Chapter No.	Mitigation Ref.	EIAR Section Ref	Description of Mitigation/Monitoring measure
Ch 5 Biodiversity **(Pre Construction)**	**BIO 1**	**5.12.2**	**Impacts to existing site biodiversity pre construction commencing** Site preparation and construction must be confined to the Proposed Development site only and it must adhere to all the mitigation measures outlined in this Chapter. Work areas should be kept to the minimum area required to carry out the proposed works and this area should be clearly marked out in advance of the proposed works. Prior to the commencement of developments on site, the site engineer and the contractors must be made aware of the ecological sensitivity of the Proposed Development site and its connection to the Lower Shannon SAC. They must be made familiar with the mitigation measures outlined in this Chapter and the CEMP and a signed statement saying that they have taken on board the mitigation measures contained herein should be presented to the local authority along with the Notice of Commencement. The applicant will be responsible for alerting the engineers and contractors to the sensitivity of the habitats and water receptors surrounding the Proposed Development site. This will be done prior to the commencement of any site works.

	BIO 2	**5.12.3**	**Protection of Terrestrial Habitats and Features** In accordance with the policies and objectives of the Regional and County Development Plans, the existing green infrastructure (GI) of the Proposed Development site, i.e., the treelines and hedgerows, must be incorporated into the development. In order to prevent damage to treelines / hedgerows in the Proposed Development site that are to be retained, then protective barrier fencing should be erected at a minimum 2m out from these boundaries to protect these features prior to the commencement of site clearance works. There must be no dumping or storage of construction waste or machinery in this zone during construction. Use of native trees and shrubs specified in landscaping maps provided in accordance with British standards. incorporate detail into habitat/floral mitigation/impacts. Any small tree or shrubs that require removal should be removed outside of the bird nesting season (March – August). .
CH 4 Biodiversity (During Construction)	**BIO 3**	**5.12.4.1**	**Protection of Water Quality (Ballyteige Stream) and Management of Pollutants** Adhereance to the following best practice documents: Construction Industry Research and Information Association (CIRIA) (2005) Environmental Good Practice on Site (C692). Construction Industry Research and Information Association (2001) Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532). Construction Industry Research and Information Association (2000) Environmental Handbook for Building and Civil Engineering Projects (C512). Environmental Protection Agency (2015) List of Waste and Determining if Waste isHazardous or Non-Hazardous. Environment Agency et al. (2015) Guidance on the Classification and Assessment of Waste, Technical Guidance WM3.

			Efficient construction practices and sequences should be employed on site, and this will minimise soil erosion and potential pollution of local watercourses with soil and sediment. Unnecessary clearance of vegetation should be avoided and only areas necessary for building works should be cleared. The retention of these areas will also help retain storm water run-off from the site during construction and operation. It is vital that there is no deterioration in water quality at the Lower Ballyteige stream. Therefore, strict controls of erosion, sediment generation and other pollutants associated with the construction process should be implemented, including the provision of attenuation measures, silt traps or geotextile curtains to reduce and intercept sediment release into any local watercourses.
			Works should be avoided during periods of heavy rainfall. There must be no uncontrolled discharges of contaminated waters to ground or surface waters from this development, either during the construction or operation of the development. The control and management of hydrocarbons on site will be vital to prevent deteriorations in surface and groundwater quality locally. The following measures should be employed on site:

			During construction re-fuelling of equipment and machinery must be done off site. If this is not possible, then a dedicated re-fuelling location must be established on site in the compound area away from ground clearance or rock-breaking activities. Spill kits stations must be provided at the fuelling location for the duration of the works. Staff must be provided with training on spill control and the use of spill kits. All fuel storage containers must be appropriately bunded, roofed and protected from vehicle movements. These bunds will provide added protection in the event of a flood event on site. All chemicals must be stored as per manufacturer's instructions. A dedicated chemical store within a building must be provided on site if chemicals are to be stored on site. Procedures and contingency plans must be established on site to address cleaning up small spillages as well as dealing with an emergency incident. A stock of absorbent materials such as sand, spill granules, absorbent pads and booms should be kept on site, on plant working near the water and at the refuelling area. Daily plant inspections will be completed by all plant operators on site to ensure that all plant is maintained in good working order. Where leaks are noted on these inspection sheets, the applicant must remove the plant from operations for repairs. All personnel shall observe standard precautions for handling of materials as outlined in the Safety Data Sheets (SDS) for each material, including the use of PPE. Where conditions warrant, emergency spill containment supplies should be available for immediate use.

			Best practice concrete / aggregate management measures must also be employed on site during construction. It is important that run-off from the construction works does not enter the Ballyteige stream/ River Maigue or any drains that lead to this river. Therefore, it is recommended that silt fences are installed along the eastern border of the construction site area. The silt fence should be sturdy and constructed of a suitable geotextile membrane (Hy-Tex Terrastop Premium silt fence, or similar) to ensure that water can pass through, but that silt will be retained. The silt fences must be capable of preventing particles of 425mm from passing though. The footing of the fencing to be buried into the ground and the visible fencing to be ca. 0.5m high. An interceptor trench will be required in front of this silt fence. The silt fences should be monitored daily to ensure that they remain functional throughout the construction of the Proposed Development. Maintenance of the fences should be carried out regularly. Fences should be inspected thoroughly after periods of heavy rainfall. Concrete Washout Skip: Chutes of concrete trucks are only to be washed out into an impermeable lined (polythene) skip. The washout water is to be removed off-site for treatment. The concrete washout skip is to be located to the east of the site, where the underlying overburden is greater. Excavations lined with an impermeable liner are not permitted as concrete washout bays on the site.

			Large excess loads of concrete are to be returned to the supplier or poured into concrete block modules (Betonblock or similar design), in order to minimise waste and reduce the risk of concrete being dumped throughout site. Best practice in bulk-liquid concrete management should be employed on site, addressing pouring and handling, secure shuttering, adequate curing times etc. Stockpile areas for sands and gravel must be kept to a minimum size, well away from drains on site. Where concrete shuttering is used, measures should be put in place to prevent against shutter failure and control storage, handling and disposal of shutter oils. Activities which result in the creation of cement dust should be controlled by dampening down the areas. Raw and uncured waste concrete should be disposed of by removal from the site.
	BIO 4	**5.12.4.2**	**Management of Construction Waste and Soil** All construction waste must be removed from site by a registered contractor to a registered site. Evidence of the movement and safe disposal of the construction waste must be retained and presented to the Local Authority upon request. Removal of the construction waste should occur as soon as possible after construction works. There must be no disposal of construction waste or topsoil in any designated site or site of biodiversity value. All topsoil generated from site works should be stored within the Proposed Development site until it is required for landscaping. It must not be stored outside the Proposed Development site boundaries, and it must not be used for the infilling of any area outside of the Proposed Development site. If there is more topsoil than is needed for landscaping, it must be removed from site by a registered contractor for appropriate use elsewhere. The end location of the topsoil must be identified and records presented to the local authority if requested.

	BIO 4	**15.12**	**Improved Agricultural Grasslands** The landscaping of the site offers the potential for biodiversity enhancements within the site. Any existing gappy hedges should be enhanced with native shrubs if possible, such as hawthorn, gorse, and blackthorn. Planting should focus on providing year-long interest for pollinators. Selected areas around the site to be seeded with species rich grassland to promote biodiversity.
	BIO 5	**15.12**	**Hedgerows and grassy verges** Where possible, existing hedgerows should be retained to maintain habitat connectivity. If removal is unavoidable, replacement native hedgerow planting should be implemented along the site boundary or within green buffer areas. Protective measures should be in place during construction to avoid unnecessary root damage or compaction of soil around retained hedgerows.
	BIO 6	**5.12**	**Disturbance to Local Wildlife** In accordance with the policies and objectives of the Regional and County Development Plans, the existing green infrastructure (GI) of the site, i.e., the stonewalls and hedgerows, must be incorporated into the development. In order to prevent damage to treelines / hedgerows in the site that are to be retained, then protective barrier fencing should be erected at a minimum 2m out from these boundaries to protect these features prior to the commencement of site clearance works. There must be no dumping or storage of construction waste or machinery in this zone during construction. Any small tree or shrubs that require removal should be removed outside of the bird nesting season (March – August).

	BIO 7	**5.12**	**Protection of Bats** During the construction of the proposed development, general mitigation measures for bats will follow the National Road Authority's 'Guidelines for the Treatment of Bats during the Construction of National Road Schemes' NRA (2005) and the 'Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 25' (Kelleher, C. & Marnell, F. (2006)). These documents outline the requirements that should be met in the pre-construction and construction phases of developments to minimise negative impacts on roosting bats or prevent avoidable impacts resulting from significant alterations to the immediate landscape. Lighting near the mature oak tree retained (as well as other retained vegetation) within the site should be avoided. Construction works will primarily take place during hours of daylight to minimise disturbance to any nocturnal mammal species. Where lighting is required, lighting mitigation measures will follow Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers (Bat Conservation Ireland, 2010).
	BIO 8		**Lighting During Construction** Lighting will be provided with the minimum luminosity necessary for safety and security purposes. Where possible, lighting will be restricted to the working area and using the cowl and angling noted above, will minimise overspill and shadows on sensitive habitats outside the construction area. During construction, lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact on retained vegetation within and adjoining the site. Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting. Where possible, construction lights will be switched off when not in use.

	BIO 9		**Enhancement Measures**The landscaping of the site offers the potential for biodiversity enhancements within the site. Any existing gappy hedges should be enhanced with native shrubs if possible, such as hawthorn, gorse, and blackthorn. Planting should focus on providing year-long interest for pollinators.mature trees are to be retained and maintained where possible, as a biodiversity enhancement feature and potential roosting structure for bats.The treelines and hedgerows around the site are important ecological corridors. These features should be enhanced and maintained for the benefit of wildlife.
Ch 6 Population & Human Health	**PHH 1**	**6.7.1**	**Impacts to local Population during the Construction Phase** Potential impacts during the construction phase will be minimised through the implementation of the Construction Environmental Management Plan which will be submitted to the council prior to construction.
	PHH 2	**6.7.1**	**Air Pollution** Construction and operation phase mitigation measures are outlined in Chapter 9: Air, Odour & Climate.
	PHH 3	**6.7.2**	**Noise Pollution** Construction and operation phase mitigation measures are outlined in Chapter 10: Noise and Vibration.

	PHH 5	**6.7.5.4**	**Human Health** Adverse health and safety effects during the construction phase will be minimised through the implementation of the Construction Management Plan on site.
Ch 7 Land Soils & Geology	**LSG1**	**7.6.1**	**General Mitigation Measures** Construction Environmental Management Plan (CEMP) The implementation and compliance with the conditions of the CEMP will be overseen by the Project Supervisor Construction Stage (PSCS) and/or onsite Environmental or Ecological Clerk of Works (ECoW) where necessary
	LSG2		Site preparation and construction must be confined to the Proposed Development only and it must adhere to all the mitigation measures outlined in this Chapter. Work areas should be kept to the minimum area required to carry out the proposed works and this area should be clearly marked out in advance of the proposed works
	LSG3		Prior to the commencement of developments on site, the PSCS/ ECoW will ensure that contractors will be made aware of the sensitive receptors identified in this chapter and the associated mitigation factors. A signed statement saying that they have taken on board the mitigation measures contained herein should be presented to the local authority along with the Notice of Commencement
	LSG4		A wheel wash/ power wash facility will be established at the site-setup stage of construction to limit the translocation of sediment onto the local road network.

	LSG5		A best practice measure in reducing the risk of the translocation of invasive species all machinery initially arriving to site will be inspected. Any dirty equipment will be refused entry to site.
	LSG6		All construction waste will be removed from site by a registered contractor to a registered site. Evidence of the movement and safe disposal of the construction waste will be retained and presented to the Local Authority upon request. Removal of the construction waste will occur as soon as possible after construction works. Harmful materials such as fuels, oils, greases, paints and hydraulic fluids must be stored in bunded compounds well away from storm water drains, gullies and at least 50m of any waterbody in the Site and surroundings. Refuelling of machinery should only take place at petrol stations or, if this is not practicable and refuelling must take place on site, in the case of equipment such as generators, pumps, compressors, or even construction machinery and vehicles, this should be done using drip trays.
	LSG7		The following Guideline documents should be adhered to: - Construction Industry Research and Information Association (CIRIA) (2005) Environmental Good Practice on Site (C692). - Construction Industry Research and Information Association (2001) Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532). - Construction Industry Research and Information Association (2000) Environmental Handbook for Building and Civil Engineering Projects (C512). - Environmental Protection Agency (2015) List of Waste and Determining if Waste is Hazardous or Non-Hazardous. - Environment Agency et al. (2015) Guidance on the Classification and Assessment of Waste, Technical Guidance WM3.

	LSG8		**Topsoil Removal** Excavated topsoil will be stockpiled in an area abounded by silt fencing to contain/ reduce any sediment run-off during times of inclement weather. Driving machinery on topsoil stockpiles is not advised as it damages the soil structure, reduces porosity, and subsequent percolation rates, and can result in 'smearing' of the soil surface, which prevents water infiltration into the soil. Any excess topsoil will be removed from site and disposed of appropriately Stockpiling and slight compaction of stockpiles to minimise both hydraulic and climatic erosion. Running stockpiles in the direction of prevailing wind to minimise windborne erosion rates, SW-NE. (EPA, 2013). Construction of silt fences around topsoil stockpiles to contain sediment run-off. Minimise the export of topsoil off site by incorporating in the final landscape design. Minimise handling and tracking of material to maintain optimum soil structure. Landscaping to take place as soon as possible to reduce exposure of subsoil and topsoil stockpiles. Works will be avoided during periods of extended rainfall. All topsoil generated from site works should be stored within the Proposed Development until it is required for landscaping. It must not be stored outside the Proposed Development boundaries and it must not be used for the infilling of any area outside of the Proposed Development. If there is more topsoil than is needed for landscaping, it must be removed from site by a registered contractor for appropriate use elsewhere. The end location of the topsoil must be identified and records presented to the local authority if requested.

	LSG9		**Excavation** Excavation work will be conducted in stages to minimise the exposure of unprotected soil, subsoil and bedrock. Where possible excavated subsoil material will be reworked and used on site. A geotechnical investigation of the site will be required in order to assess the potential of the underlying soil, subsoil and bedrock for reuse Stockpiling material in appropriate locations, away from water sources, with a silt fence surrounding it to reduce the rate of run-off from hydraulic conditions. Light compaction of stockpiles to minimise the rate of erosion from climatic methods. Stockpile heights should be kept to a minimum to ensure stockpile stability and minimise wind borne erosion Excavations will be postponed in high rainfall conditions to reduce the risk of excavation collapse and erosion to soil and subsoil profiles. If extreme weather conditions are forecast high sediment stockpiles will be covered to minimise erosion. Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and bedrock. All temporary excavations will be conducted in a safe manner to ensure sidewall stability and prevent collapse of excavations. Mobile shoring equipment will be utilised to this end where required. All long-term soil stockpiles are to be planted with a vegetative cover to bind the soil and improve slope stability.

			Engineered retaining walls are to be installed where required to ensure stability of contiguous and Proposed Development topography. “Mole Plough” installation method will be utilised to install the discharge pipe to the Lower Ballyteige watercourse located to the east. This will limit trenching requirements and reduce the risk of sediment laden run-off. The timing of installation of the discharge pipe into the Lower Ballyteige watercourse must be scheduled to ensure no instream works are carried out during the closed season for instream works (October 1st to June 30th). IFI must be notified prior to works taking place. The timing of works shall be in accordance with to IFI (2016) Guidelines on the Protection of Fisheries during Construction Works in and Adjacent to Water. Works associated with the headall construction should be supervised by an Ecological Clerk of Works (ECoW).
	LSG10		**Soil Compaction** Construction of a hardcore gravel access road on and around the site. Confine site traffic to designated routes. Minimise traffic flows on site and establish a construction stage parking compound. Avoid the use of oversized machinery when and where possible. Prevent movement of vehicles on site during and after periods of rainfall. Driving machinery on topsoil stockpiles will be avoided as it damages the soil structure, reduces porosity, and subsequent percolation rates, and can result in ‘smearing’ of the soil surface, which prevents water infiltration. Works will be avoided during periods of extended rainfall.

	LSG11		**Run-Off** As a standard best practice measure a silt fencing will be erected along the eastern extents of the Proposed Development site to limit accidental discharge of sediments into the adjacent Lower Ballyteige watercourse. The fencing is to be made of a permeable filter fabric (Hy-Tex Terrastop Premium silt fence, or similar), with the footing of the fencing to be buried into the ground and the visible fencing to be ca. 0.5m high. The silt fence will be visually inspected daily to ensure that they remain functional throughout the construction of the Proposed Development. Maintenance of the fences will be carried out regularly. Fences will be inspected thoroughly after periods of heavy rainfall. Excavated and/or imported material will be stockpiled and silt fencing will be constructed around stockpile locations to contain/ reduce any sediment run-off during times of inclement weather. Compacting of stockpiles will reduce the rate of airborne and hydraulic erosion. Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site. Harmful materials such as fuels, oils, greases, paints and hydraulic fluids must be stored in bunded compounds well away from storm water drains and gullies. Refuelling of machinery should be carried out using drip trays. A temporary drainage system will be established complete with a settlement pond to remove contaminants from run-off, prior to discharge. Temporary staff welfare facilities will be installed on site at the pre-commencement stage. These will include toilet facilities. All foul discharges from welfare facilities will be collected in a septic storage tank. This tank will be regularly emptied, and the contents disposed of at a registered facility.

	LSG12		**Concrete** Chutes of concrete trucks are only to be washed out into an impermeable lined (polythene) skip. Excavations lined with an impermeable liner are not permitted as concrete washout bays. Large excess loads of concrete are to be returned to the supplier or poured into concrete block moulds (Betonblock or similar design) in order to minimise waste and reduce the risk of contaminants leaching into the surrounding environment. Best practice in bulk-liquid concrete management should be employed on site addressing pouring and handling, secure shuttering, adequate curing times etc. Where concrete shuttering is used, measures will be put in place to prevent against shutter failure and control storage, handling and disposal of shutter oils. Activities which result in the creation of cement dust will be controlled by dampening down the areas. Raw and uncured waste concrete will be disposed of by removal from the site.

	LSG13		**Construction Contaminants** Fuels, oils and other environmental deleterious chemicals are to be stored in a bunded well-ventilated chemical stores. Use of such chemicals and fuels is to be contained to bunded areas, where possible. Fuel bowsers to be located in bunded areas which can cater for 110% of the primary vessel capacity. Any spills or leaks to the soil is to be immediately contained and the soil in question is to be removed by a licensed contractor and disposed of in a registered facility. Oil spill containment kits are to be situated near areas of potential spills. Regular inspections carried out on plant and machinery for leaks and general condition. Use of ready-mixed supply of wet cement products. Scheduling cement pours for dry days. Maintenance and repair works will be carried out at least 10m from any collection of surface water. No refuelling will be undertaken within 50m of the Maigue river. Ancillary machinery equipment such as hoses, pipes and fittings which contain hydrocarbons will be stored within a bund or drip tray.

			Any repair works required on machinery involving fuel and oil control will be carried out off-site where practical, if not possible then repairs will be undertaken on a clean hardcore area of site. Unless unavoidable, repair works carried out in the field where machinery is operational will use spill trays and absorbent materials to prevent release of contaminants to the ground. Daily checks prior to start-up of plant and machinery will minimise the risk of breakdown and associated contamination risks for on-site repairs. Daily pre-start checks will be undertaken and records maintained. A clean site policy and diligent housekeeping will also reduce the potential of hydrocarbon release on-site.
	LSG14		**Importation of Contaminated Materials** All material will be sourced and transported by registered suppliers. All materials will be inspected prior to acceptance on site. Any deliveries found to be contaminated will be refused access to deposit on site. Any contaminated materials accidentally deposited on site will be removed immediately from site. If this is not possible then it will be stored in a “quarantine zone”. The quarantine zone is to be lined with an impermeable liner which the material will be stored on. A cover will be placed over the liner to avoid hydraulic run-off of contaminated materials. The quarantine zone is to be fenced off and surrounded by silt fencing, as a secondary containment measure.
	LSG15		**Excavation of Contaminated Soils** All excavated materials will be visually assessed for contamination. Any contaminated material detected will be sent for analysis to a suitable environmental laboratory and subsequently quantified, segregated and transported for disposal by a licenced contractor.

Ch 8 Hydrology + Hydrogeology	**HH1**	**8.6.1**	**General Mitigation Measures** Construction Environmental Management Plan (CEMP).
	HH2		**Increased Run-off and Sediment Loading** Harmful materials such as fuels, oils, greases, paints and hydraulic fluids must be stored in bunded compounds well away from storm water drains and gullies. Refuelling of machinery should be carried out using drip trays. A temporary drainage system will be established complete with oil interceptors and settlement ponds to remove contaminants from run-off, prior to surface water discharge off-site. Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site. Covers are to be provided over soil stockpiles when high wind and inclement weather are encountered if required. Storage of harmful materials and stockpiles should not be in close proximity to the adjacent drainage ditch and/or the sinkhole present at the eastern boundary of the site. Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer. Landscaping should be carried out as soon as possible to minimize weathering and reduce the increased vulnerability in the area surrounding the sinkhole.

	HH3		**Accidental Spillages of Harmful Substances** Establishment of bunded oil and chemical storage areas. Refuelling of mobile plant in designated areas provided with spill protection. Fuel bowsers to be located in bunded areas which can cater for 110% of the primary vessel capacity or 25% of the total volume of the substance which could be stored withing the bunded area. Only appropriately trained site operatives permitted to refuel plant and machinery on-site. Regular inspections carried out on plant and machinery for leaks and general condition. Emergency response plan. Spill kits readily available throughout the site. Use of ready-mixed supply of wet cement products. Scheduling cement pours for dry days.
	HH4		**Increased Groundwater Vulnerability/ Excavation of Bedrock Aquifer** Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer. Landscaping should be carried out as soon as possible to minimise weathering. Additional trial pits are recommended prior to construction in the area around TP-04 in order to verify the presence of groundwater. If possible, trial pits should aim to be excavated after periods of heavy rain. Installation of impermeable liner is recommended under the attenuation tanks. .

	HH6		**Excavation of Contaminated Soils** All excavated materials will be visually assessed for contamination. Any contaminated material detected will be sent for analysis to a suitable environmental laboratory and subsequently quantified, segregated and transported for disposal by a licenced contractor.
	HH7		**Conversion of Permeable Soils to Hard standing** The following measures will be implemented in the construction phase to minimise an increase of flood risk to the receiving catchment: Regrade the existing western boundary ditch to flow to the north and to turn to the east at the northeast corner of the proposed development footprint. The proposed ditch will fall from the southwest corner of the development boundary to the stream on the western boundary at a gradient of approximately 1:500. The rate of discharge to the stream will be restricted to a maximum permissible rate of 13.3l/s for the Upper level (service yard) and 6.50 l/s for the Lower level (sump). This rate is calculated in accordance with criteria defined in the Greater Dublin Strategic Drainage Study [‘GDSDS’] to ensure the proposed development will not affect the flow / flood regimes in the receiving environment Pipes are designed for small catchment areas as defined in GDSDS, based on the modified rational method and a rainfall intensity of 50mm/ hour onto impermeable surfaces. All surface water pipes have been designed to achieve a minimum self-cleansing velocity of 0.75m/s

			Surface water pipework will be laid to a gradient no flatter than 1:500 Backdrop heights will be greater than 0.6m where practicable The GDSD requirements with respect to interception volume, long-term storage volume and treatment volume have been considered. Minimum surface water pipe size of 225mm Minimum depth of cover to pipework of 1.2m below trafficked area, or where this cannot be achieved, adequate protection will be provided. Maximum depth of pipework of 5m Roughness value for surface water pipework, ks, 0.6mm Attenuation tanks will accommodate the total catchment area capacity and will provide a minimum storage capacity of 468 m3(Lower Level – Sump) and 964m3 (Upper Level – service yard).
CH 9 Air, Odour & Climate	**AOC1**	**9.8**	**Fuel Storage** Temporary Fuels used during construction will be stored in sealed containers.
	AOC2		**Stockpiling** At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust

	AOC3		**Use of heavy plant / multiple plant use** The Contractor must monitor performance of plant and machinery to ensure that the proposed mitigation measures are implemented, and that dust effects and nuisance are minimised. The prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
	AOC4		**Topsoil stripping** During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions. During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided. Overburden material shall be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors. Sufficient watering will take place to ensure the moisture content is high enough to suppress dust.

	AOC5		**Construction and operation of compound buildings and amenities** Implementation of Construction Environmental Management Plan. The specification of a site policy on dust and the identification of the site management responsibilities for dust issues. The development of a documented system for managing site practices with regard to dust control. The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed. The specification of effective measures to deal with any complaints received. The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details site. A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out. At all times, the procedures put in place will be strictly monitored and assessed.
			The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. 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 a dedicated logbook.
CH10 Noise & Vibration	**NV1**	**10.7.2**	Construction phase mitigation measures as outlined in the CEMP.

	NV2		The contract documents shall specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction on open sites – Noise. The following list of measures will be implemented, where necessary, to ensure compliance with the relevant construction noise criteria: No plant used on site will be permitted to cause an on-going public nuisance due to noise. The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working for the duration of the contract. Compressors will be attenuated models, fitted with properly lines and sealed acoustic convers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.

			Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen. During the construction programme, supervision of the works will be include ensuring compliance with the limits detailed in Section 6.2.1 using methods outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 07:00hrs and 19:00hrs weekdays and between 08:00hrs and 16:00hrs on Saturdays. However, any necessary or emergency out of hours working will be agreed in advance with the local Planning Authority.
CH11 Landscape and Visual	**LV1**	**11.6**	**General Mitigation Measures** Any area of site subject to soil disturbance is to be repaired, the soil reworked into the site, recontoured and modelled. Matching sod/seed sown to blend the topography back into the rural landscape. All construction materials, fill, gravel, etc to be removed from the site and surrounding fields once the works are complete. Earthworks and hedgerow banks to facilitate appropriate drainage for the soil type and this to be detailed at the design detail stage. An irrigation plan to be put in place to allow for establishment of plantings with irrigation water source to be identified prior to the spring of the first year of planting. A plan to irrigate in hot weather and as required to be put in place especially for the first two years after planting. Recovered process water may be used.

	LV2		**Avoidance, Prevention, Reduction and Offsetting** The positioning of the digestion tanks into the topography by retaining the bunds and sloping the access into the site of the Proposed Development has prevented the structures breaking the skyline at specific viewpoints and reduced its impact.
	LV3		**Disease** The avoidance of Fraxinus excelsior, ash, in any infill planting in the hedgerow system will not only protect existing landscape trees from the biologically infectious chalara disease, but it will also protect the local habitats that ash supports for as long as possible, by avoiding this biosecurity risk. Any plant materials brought on site to bulk out the plantings during the operational phase of the project to be disease free, to at a minimum hold all relevant plant passports and preferably be sourced field grown and inspected at source prior to planting. This is to avoid spreading potential infections to local populations. All trees and shrubs will conform to the specification for nursery stock as set out in British Standard 3936 Parts 1 (1992) and 4 (1984). Advanced Nursery stock trees if used in tree planting shall conform to BS 5236.
	LV4		**Topsoil** Avoid bringing any additional topsoil on site. Use local soil to make localised repairs. Where additional topsoil is required use from a matching source as local as possible to the Proposed Development. Do not mix topsoil and sub soil during construction. Identify storage area where soils are to be stored separately until they are reworked into the soil.

	LV5		**Invasive Species** Avoid spreading or bringing invasive plant species onsite in soil or plant materials. Soil and plant material hygiene to be observed and plant, boots, tools and equipment to be clean before being brought on site. All involved at the construction stage to be made aware of this prior to coming on site. Invasive Alien Plant Species include; Japanese knotweed *Fallopia japonica* Giant knotweed *Fallopia sachalinensis* Bohemian knotweed *Fallopia x bohemica* Himalayan knotweed *Persicaria wallichii* Old man's beard *Clematis vitalba* Winter heliotrope *Petasites fragrans* Garden Yellow Archangel *Lamiastrum galeobdolon ssp argentatum* Of these knotweed is most likely to be problematic if introduced onsite. Palisade fencing to be allowed to soften in over time with vegetation permitted to come through the fence. All hedgerows and hedgerow trees to be protected during the construction process with a root protection zone established outside the dripline of the trees and hedges whichever is greater, prior to the commencement of construction. No root systems to be trenched severed or cut and there is to be no piling of building materials, soil, plant, containers or any loading material on the protected root zone during construction. All parties involved in the construction process to be made aware of this avoidance measure. No unnecessary damage is to occur to the existing tree and hedgerow complex during construction or afterwards during operations.
	LV6		Planting specifications to be overseen by a qualified landscape architect during the construction and operational period as required.

	LV7		**Reinforcing Landscape** Any damage to field boundaries received during construction to be repaired in the traditional manner. Low banks for planting trees and hedgerows are to be reinforced where possible. The screening planting and new tree planting will reinforce much of the landscape pattern. Following correct landscape construction and planting, all plant material is to be properly and satisfactorily, irrigated pruned and given correct amounts of appropriate fertiliser to ensure plant health and vigou
	LV8		**Landscape Maintenance and Management Plan** A landscape management plan is to be produced and ready post construction so that all new and existing planting, hedgerows, and trees will be immediately cared for and promptly maintained. This plan along with any necessary method statements to be produced during the operational phase of the planting by a qualified landscape architect. Landscape maintenance and management plans ought to remain in place until all plantings are fully established and during the life of the Anaerobic Digestion Facility. The aim of the plan is to continue to ensure landscape character is maintained as well as biodiversity and habitat protection. A landscape maintenance and management plan will include a small woodland/hedgerow management plan and will address appropriate hedgerow cutting, timing of operations, protection of hedgerow habitats, address irrigation of newly planted trees or infill plants, accessing water, pruning, weeding, fertilising, trimming, management of dead and diseased wood, and general maintenance. Any areas requiring artificial shelterbelt to help them establish are to be identified at the outset after planting is commenced. Plant establishment to be provided for appropriately. All amelioration as required for good plant establishment to be tailored to the plants, trees and hedgerows to satisfy their growing needs.

	LV9		**Disease** The avoidance of *Fraxinus excelsior*, ash, in any infill planting in the hedgerow system will not only protect existing landscape trees from the biologically infectious chalara disease, but it will also protect the local habitats that ash supports
CH12 Traffic & Transport	**TT1**	**12.6.1**	A detailed Traffic Management Plan (TMP), produced in accordance with Chapter 8 of the Traffic Signs Manual, will be finalised and agreed upon with the Local Authority prior to construction works commencement. The following mitigation measures are proposed during the construction phase of the development: Appointment of a Construction Project Manager to be responsible for the day-to-day implementation of measures outlined in the TMP; Identify routes to be used in the delivery and export of materials to the site and routes that shall be avoided by HGVs; Monitor the condition of the roads throughout the construction period and a truck-mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required; and Access to the site to be monitored at all times by a banksman who will direct traffic safely into the construction site and facilitate the safe navigation of larger construction vehicles.
CH13 Archaeology & Cultural Heritage	**ACH 1**	**13.4.1**	Given the proximity of LI038-130----, the adjacent Ringfort - rath it is recommended that a programme of archaeological testing be carried out well in advance of construction. 'Test excavation is that form of archaeological excavation where the purpose is to establish the nature and extent of archaeological deposits and features present in a location which it is proposed to develop (though not normally to fully investigate those deposits or features) and allow an assessment to be made of the archaeological impact of the proposed development. It may also be referred to as archaeological testing' (DAHGI 1999a, 27).

	ACH 2		A suitably qualified archaeologist should be appointed to advise the design team on archaeological matters, liaise with the relevant authorities, prepare an archaeological licence application and method statement, and complete the archaeological testing work. Testing should be carried out under licence to the National Monuments Service at the DHLGH. The application for such a licence requires a detailed method statement, outlining the procedures to be adopted to monitor, record, and recover material of archaeological interest during such work.
	ACH 3		Should archaeological material be uncovered at any location, the feature will be summarily investigated to determine the form, age, nature, depth, and extent of the feature. The feature will be planned, photographed, and recorded to best professional standards.
	ACH4		Adequate funds to cover excavation, post-excavation analysis, and any testing or conservation work required should be made available if required. Upon completion of the works dissemination of the results will take the form of a stratigraphic report and full report to publishable standard lodged with the licensing section (NMS) and the Planning Section (NMS) and the National Museum of Ireland. A summary of the report will also be submitted to the Excavations Bulletin within six weeks of the end of fieldwork. Should results warrant it, wider dissemination in the form of a full publication may be recommended.
	ACH5		Where archaeological material is identified, the developer will submit an archaeological mitigation strategy and a detailed method statement for written agreement with the relevant authorities detailing proposed mitigation including, preservation in situ by way of avoidance or redesign, and/or archaeological excavation under a Section 26 licence in advance of development.

	ACH6		The agreed archaeological mitigation (preservation in situ/full excavation) shall take place under licence prior to the commencement of development. The developer shall make provision for excavation, post excavation, interpretation, and publication of the results. A preliminary report detailing the findings of the agreed resolution shall be submitted to the planning authority within four weeks of the licence expiry and a full and final report shall be submitted to the planning authority within 1 year of the licence expiry date.
CH14 Material Assets	**MA1**	**14.6.1**	**Roads Infrastructure** A detailed Traffic Management Plan (TMP), produced in accordance with Chapter 8 of the Traffic Signs Manual, will be finalised and agreed upon with the Local Authority prior to construction works commencement. Appointment of a Construction Project Manager to be responsible for the day-to-day implementation of measures outlined in the TMP Identify routes to be used in the delivery and export of materials to the site and routes that shall be avoided by HGVs Monitor the condition of the roads throughout the construction period and a truck-mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required Access to the site to be monitored at all times by a banksman who will direct traffic safely into the construction site and facilitate the safe navigation of larger construction vehicles. Traffic management measures will be implemented on a temporary basis while connections underground services (gas, telecommunications, water) are established.

	MA2		**Foul Water Network** Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer. All foul water infrastructure to be installed in accordance with the relevant industry standards.
	MA3		**Surface Water Network** A temporary drainage system will be established complete with oil interceptors and settlement ponds to remove contaminants from run-off, prior to discharge off-site. Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site. Covers are to be provided over soil stockpiles when high wind and inclement weather are encountered, if required. Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer. Landscaping to take place as soon as possible to reduce weathering. Harmful materials such as fuels, oils, greases, paints and hydraulic fluids must be stored in bunded compounds well away from storm water drains and gullies. Refuelling of machinery should be carried out using drip trays.
	MA4		**Public Water Network** Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer. Consultation with Irish Water be undertaken prior to works on the existing public water network and notification given to local population.

	MA5		**Gas Network** No mitigation measures are required. There will be no impact to the existing gas network during the construction phase as there are no gas pipeline connections to be established to the existing gas grid network. The development would have a positive impact on the gas network, with an opportunity to supply the national gas grid with a renewable source of biogas.
	MA6		**Electricity Network** Consultation with ESB and Dial-Before-You-Dig platforms prior to works on the existing electricity network. Implement best practice measures when working on electricity lines. Inform the public of when works are to be carried out to ensure they are aware of any temporary interruptions in power supply that may occur.
	MA7		**Telecommunications Network** Consultation with Eir and Dial-Before-You-Dig platforms prior to works on the existing telecommunications network. Implement best practice measures when working on telecommunications lines. Inform the public of when works are to be carried out to ensure they are aware of any temporary telecommunications outages that may occur.

	MA8		**Municipal Waste** Inform staff through toolbox talks/training etc on the relevance and importance of correct waste segregation and management. Ensure waste receptacles available for the different identified waste streams to ensure proper and efficient segregation of waste onsite. Install signage to promote and encourage proper waste segregation, recycling etc. Ensure bins/skips are not allowed to overflow to prevent litter build-up onsite. Ensure all bins have lids and skips are covered when be removed offsite to prevent littering elsewhere. Ensure waste is collected by a registered vendor and disposed of at a facility licenced to take said waste. Maintain good waste records onsite to ensure all is accounted for. Concrete Washout Skip: Chutes of concrete trucks are only to be washed out into an impermeable lined (polythene) skip. The washout water is to be treated prior to discharge. The concrete washout skip is to be located to the east of the site, where the overburden is greater. Excavations lined with an impermeable liner are not permitted as concrete washout bays.

16.3 Operational Phase

Table 16.1: Mitigation and monitoring (Operational Phase)

EIAR Chapter No.	Mitigation Ref.	EIAR Section Ref	Description of Mitigation/Monitoring measure
Ch 5 Biodiversity **(During Operation)**	**BIO 10**	**5.12.5.1**	**Enforcing the Enviromental Management System** An Environmental Management System (EMS) accredited to ISO14001:2015 ill be prepared and implemented by the operating company during the operational phase. The Proposed Development will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA). The licence will contain several conditions which the operator must remain in compliance with for the entire duration of the Anaerobic Digestion Facility's lifespan. Typical conditions relating to the protection of receptors include: Emissions Limit Values for all emissions including surface water Monitoring requirements for surface waters Resource use and energy efficiency Waste management control and documentation Storage and transfer of substances Facility management Accident prevention and emergency response including fire water retention Operational Controls

	BIO 11		**Uncontrolled releases to the Ballyteige stream** Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses. Use of spill kits, bunded pallets and secondary containment units, as appropriate. All bunds sized to contain 110% of the volume of the primary storage vessel. Environmental Management System to include site specific standard operating procedures pertaining to waste management and emergency response. There will be no direct discharges to surface or groundwater bodies during the operational phase. The entire digestion tank area of the Proposed Development site will be underlain by an impermeable bund structure, acting as secondary containment in the event of a catastrophic failure. Tanks and bunds will be subject to integrity assessments by a suitably qualified engineer.

	BIO 12	**5.12.5.2**	**Harmful effects of Landscaping and Lighting on Biodiversity** The hedgerows around the site are important ecological corridors. These features should be enhanced and maintained for the benefit of wildlife. The existing gappy hedges should be enhanced with some more native shrubs if possible, such as hawthorn, gorse, and blackthorn. Trees such as willow provide early sources of pollen for bees, as would fruit blossoms such as crab apple and wild cherry. Planting should focus on providing year-long interest for pollinators. Planting should be delivered in accordance with the Landscape Plan which accompanies the application. The natural verges along the hedgerows could also provide excellent opportunity for the benefit of wildlife. These should be managed as old hay meadows, cutting only in late summer. This will be of significant benefit to local pollinators. It is recommended that further actions that are outlined as part of the National Pollinator Plan should be implemented. There is a specific guide for farms (Farmland: Actions to help pollinators - //pollinators.ie/farmland). Nesting areas for solitary bees could be included by providing south or east-facing banks or areas of bare earth. Bee boxes for cavity-nesting bees could be created by drilling holes in untreated wooden blocks and attaching them to an outdoor structure. The holes should be 10cm in depth and 4-8mm in diameter at a height of at least 1.5-2m. It is important to have holes of different sizes for the different species.

			Bat boxes could be installed around the Proposed Development site, on walls, tree trunks and posts. They should be located as high as possible (at least 4m off the ground) in a sunny but sheltered location. If erecting on a mature tree, choose one that has clean bark (no ivy) with no branches for 1m radius around the location of the box. If erecting on a building, erect as close as possible to the eaves. When erecting bat boxes externally (i.e. on a tree or external wall of a building), put up a minimum of three boxes facing in different directions to provide a range of temperature conditions. For example, boxes facing from south-east to south-west allow the sun to fall on each box for part of the day. During very hot days a south-facing box may overheat, but the other boxes should have some shade. Three boxes can be arranged around the trunk of large, mature and clean trunk trees. When erecting bat boxes, erecting three different types of bat boxes will increase the chance of catering for the different species likely to be found foraging on the Proposed Development site. Guidelines for the construction of bat boxes can be obtained on the website of Bat Conservation Ireland.
			The use of herbicides within the Proposed Development site should be minimised. The clearance of vegetation around fences should be done by hand if possible. Where spraying is necessary, it should be done with a knapsack sprayed to minimise spray and target required areas only. All rodenticides use on the Proposed Development site should be in accordance with the Campaign for Responsible Rodenticide use.

			Lighting should be kept to a minimum around the remaining trees on the Proposed Development site. Guidelines from Bat Conservation Ireland will be provided for considering how to avoid light pollution of the hedgerows to allow for feeding, commuting, and roosting. There should be no lighting directed from the Proposed Development site towards mature vegetation.Lighting shall be controlled to avoid light pollution of green areas and shall be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution. None of the remaining mature trees or trees proposed for planting shall be illuminated.
			Dark corridor for movement of bats along the grounds of the Proposed Development site. Lighting shall be directed downwards away from the treetops. All luminaires shall lack UV elements when manufactured and shall be LED. A warm white spectrum (ideally <2700 Kelvin) to reduce blue light component. Luminaires shall feature peak wavelengths higher than 550nm. Tree crowns shall remain unilluminated. Planting shall provide areas of darkness suitable for bats to feed and commute.
Ch 6 Population & Human Health	**PHH 6**	**6.7.2**	**Impacts to Population & Human Health during the Operational Phase** Potential effects to the local population, employment and community are neutral to positive hence no mitigation measures are recommended for these receptors

Ch 7 Land Soils & Geology	**LSG16**	**7.6.2**	**General Mitigation Measures** An Environmental Operating Plan (EOP) will be prepared and implemented by the plant management company during the operational phase. This is a practical document which will include detailed procedures to address the main potential effects on surface water and groundwater.
	LSG17		The proposed facility will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA). The licence will contain several conditions which the operator must remain in compliance with for the entire duration of the facility's lifespan. Typical conditions relating to the protection of water receptors include:- Emissions Limit Values for all emissions including surface water- Monitoring requirements for surface waters- Resource use and energy efficiency- Waste management control and documentation- Storage and transfer of substances- Facility management- Accident prevention and emergency response including fire water retention- Operational Controls

	LSG18		**Uncontrolled Releases and Spillages** Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses. Use of spill kits, bunded pallets and secondary containment units, as appropriate. All bunds sized to contain 110% of the volume of the primary storage vessel. Environmental Management Plan (EMP) to include site specific standard operating procedures pertaining to waste management and emergency response. There will be no intentional discharge of untreated storm water to surface or ground waters during the operational phase. All stormwater discharges from site will be, with the exception of the roofs, directed through Class 1 petrol/oil interceptors prior to discharge to the Lower Ballyteige watercourse. The Digestion Tanks and Digestate Storage tanks will be located within a bunded location to the east of the site, this will act as a secondary containment in the event of loss of tank contents. All primary pipelines and bunded structures will be inspected and integrity tested prior to handover from the appointed construction contractor. All works will be installed to Construction Quality Assurance (CQA) plan.

	LSG19		**Land Spreading of Biobased Fertiliser** In order to avoid any reductions in water quality within the catchment as a whole, all biobased fertilisers must be used in accordance with S.I. 113 of 2022 European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2022). The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm. Application of biobased fertiliser to be conducted in compliance with the Nitrates Action Programme (e.g. prohibited periods and nitrogen application rates). All biobased fertiliser is to be pasteurised prior to removal from the Proposed Development to comply with Regulation (EU) 142/2011 on Animal By-Products in Organic Fertilisers.
	LSG20		**Decommissioning Phase** A Closure, Restoration and Aftercare Management Plan (CRAMP) will be developed as a condition of the industrial emission licences and in compliance with the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites set by the EPA (2012)

Ch 8 Hydrology + Hydrogeology	**HH8**	**8.6.2**	**General Miitgation Measures** An Environmental Management System (EMS) will be prepared and implemented by the operator during the operational phase. The Proposed Development will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA). Typical conditions relating to the protection of water receptors include: Site specific trigger levels will be established and agreed with the EPA Monitoring requirements for surface waters Resource use and energy efficiency Waste management control and documentation Storage and transfer of substances Facility management Accident prevention and emergency response including fire water retention Operational Controls

	HH9		**Contaminated Run-off** The Proposed Development will include two rainwater harvesting tanks designed to collect surface water runoff from the northernmost odour abatement building, the northern half of the service yard, overflow from the interim system, and runoff from the office building and parking areas. These tanks will recirculate the harvested water for various uses, including wheelwash and washdown activities, fire suppression, washdown in the silage clamp, and treatment for potable and greywater use in office facilities. The remaining impermeable surfaces, and overflow from the rainwater harvesting tanks, will be collected by a surface water network which discharges to two proposed attenuation facilities. Post-attenuation, the runoff will be discharged at the greenfield runoff rate calculated for each catchment via means of a Hydrobrake or similar approved flow control device. The attenuation tank collecting runoff from the bunded area is separate from the drainage network serving the rest of the site. An automated penstock will be installed to activate in the unlikely event of a digester or digestate tank failure, ensuring any potentially contaminated water is isolated and preventing the discharge of contaminated runoff.
			The rates of discharge to the stream will be restricted to a maximum permissible rate of 13.3l/s for the Upper level (service yard) and 6.50 l/s for the Lower level (sump). These rates are calculated in accordance with criteria defined in the Greater Dublin Strategic Drainage Study [‘GDSDS’] to ensure the proposed development will not affect the flow / flood regimes in the receiving environment. The Qbarrural calculations are outlined in the Civil Engineering report which accompanies this application.

			Design criteria adopted for the development include: Drainage systems will be designed to attenuate excess surface water runoff with suitable storage volumes All surface water run-off will discharge to the attenuation tank. The floor of the basin will be shaped to allow for the retention of silts in the pond. Regular inspection and maintenance of all treatment measures to remove accumulated silts and disposed of to an appropriately licenced landfill The digestion process area will be completely bunded and constructed to Eurocode standard (BS EN 1992-3) Pipes are designed for small catchment areas as defined in GDSDS, based on the modified rational method and a rainfall intensity of 50mm/ hour onto impermeable surfaces. All surface water pipes have been designed to achieve a minimum self-cleansing velocity of 0.75m/s Surface water pipework will be laid to a gradient no flatter than 1:500 Backdrop heights will be greater than 0.6m where practicable The GDSD requirements with respect to interception volume, long-term storage volume and treatment volume have been considered. Minimum surface water pipe size of 225mm Minimum depth of cover to pipework of 1.2m below trafficked area, or where this cannot be achieved, adequate protection will be provided. Maximum depth of pipework of 5m Roughness value for surface water pipework, ks, 0.6mm

	HH10		**Foul Water** A domestic scale wastewater treatment plant (TER 3 PACKAGED TERTIARY UNIT and a distribution attenuation layer of 100sqm placed on 144sqm of imported soil depth of 300mm) is proposed to cater for the foul water arising from staff facilities on-site only (Population Equivalent 'PE' of 6). Based on the design population for the proposed 4 workers, the population equivalent (PE) for the Proposed Development is calculated at PE6. The volume of foul water generated from the Proposed Development was calculated at 200 litres/day for hydraulic loading and 150 litres/day for organic loading. The proposed treatment system will produce an effluent with a standard compliant with SR66 the percolation area be designed on the hydraulic loading of 6 PE. The wastewater treatment plant will comprise a tertiary treatment system (6PE EuroTank BAF2 Wastewater Treatment System), followed by a 6PE EuroTank TER3 Percolation Unit. The system is proposed with discharge to a Ter3 packaged tertiary unit with a minimum 100m2 attenuation layer. Distribution layer to be placed on 144m2 of imported soil 300m depth with suitable percolation values. Imported soil to be tested for suitable percolation values as per EPA COP 2021. The treatment plant will be specified and installed by an appropriately qualified technician and will be subject to regular desludging and maintenance, subject to manufacturers recommendations.

	HH11		**Increased Groundwater Vulnerability** The site bunding is designed in accordance with IPC Guidance Note on storage and Transfer of Materials for Scheduled Activities (EPA, 2004) The tank farm area will be bunded in its entirety to ensure enough containment is provided in the unlikely event of a leak. The bund will be impermeable and provide the required storage volume i.e., a minimum of 110% of the largest single tank volume. Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses. Use of spill kits, bunded pallets and secondary containment units, as appropriate. All bunds sized to contain 110% of the volume of the primary storage vessel. Environmental operating plan to include site specific standard operating procedures pertaining to waste management and emergency response. All bunds and pipelines (foul & process) will be subject to integrity assessments every 3 years by a suitably qualified engineer.

	HH12		**Fire and Resultant Water** A Firewater Risk Assessment will be commissioned within the first six months of operation and will determine the volume of firewater retention storage require on site. Adequate firewater retention capacity is installed and maintained on-site in the event of a worst-case scenario fire event. Firewater retention will be the containment bund and underground tank in the reception building. All retention infrastructure systems will be automatically activated in the event of a fire alarm being triggered. All retention tanks, etc., shall be maintained empty, or at least to a point where the required retention capacity is available. Bunds and tanks will be constructed to Eurocode standard (BS EN 1992-3:2006)..
	HH13		**On site Flooding** The existing flood risk to the Proposed Development is negligible with the proposed site located in 'Flood Zone C'. No specific mitigation measures to alleviate flood risk to the site are recommended. The proposed stormwater management system is designed in accordance with industry standards and is projected to emulate the current greenfield runoff rates calculated at the site.

	HH14		**Conversion of Permeable Soils to Hardstanding** Regrade the existing western boundary ditch to flow to the north and to turn to the east at the northeast corner of the proposed development footprint. The proposed ditch will fall from the southwest corner of the development boundary to the stream on the western boundary at a gradient of approximately 1:500. The rate of discharge to the stream will be restricted to a maximum permissible rate of 13.3l/s for the Upper level (service yard) and 6.50 l/s for the Lower level (sump). This rate is calculated in accordance with criteria defined in the Greater Dublin Strategic Drainage Study ['GDSDS'] to ensure the proposed development will not affect the flow / flood regimes in the receiving environment Pipes are designed for small catchment areas as defined in GDSDS, based on the modified rational method and a rainfall intensity of 50mm/ hour onto impermeable surfaces. All surface water pipes have been designed to achieve a minimum self-cleansing velocity of 0.75m/s Surface water pipework will be laid to a gradient no flatter than 1:500 Backdrop heights will be greater than 0.6m where practicable The GDSD requirements with respect to interception volume, long-term storage volume and treatment volume have been considered. Minimum surface water pipe size of 225mm
			Minimum depth of cover to pipework of 1.2m below trafficked area, or where this cannot be achieved, adequate protection will be provided. Maximum depth of pipework of 5m Roughness value for surface water pipework, ks, 0.6mm Attenuation tanks will accommodate the total catchment area capacity and will provide a minimum storage capacity of 468 m3(Lower Level – Sump) and 964 m3(Upper Level – service yard).

	HH15		**Land Spreading of Biobased Fertiliser** Nutrient management plans to avoid excess fertiliser application Farmers to comply with the Nitrates Action Plan “Lay-off” period of 21 days for grazing or harvesting following application Biobased fertiliser will be pasteurised in accordance with Regulation (EU) 142/2011 on use of animal by products as organic fertiliser.
	HH16		**Attenuation Tanks** The attenuation tanks are designed for a 1:100 year event and well as to regulate the outflow from the site. Installation of Sustainable Urban Drainage Systems (SuDS) features such as Sumps in gullies and catchpits collect silts in run-off from roads, filter drains, discharge bypass separator and an attenuation tanks.
CH 9 Air, Odour & Climate	**AOC6**	**9.8**	**Biogas Release** The flare stack will have an operational capacity of 110% of the expected maximum hourly biogas production and will ensure the safe and complete combustion of the biogas where necessary.

	AOC7		**Odour Release** The odour abatement proposed for the facility will consist of odour treatment system and carbon filters with a high level of efficiency to remove impurities such as hydrogen sulphide, ammonia, bioaerosols, siloxanes etc. in the exhaust gas to prevent odour impacts of significance beyond the site boundary. H2S will be trapped on activated carbon; CO2 and water vapour will be emitted to the atmosphere. The reception hall has been designed to allow for multiple trucks to unload at any one time. This will significantly reduce the number of trucks waiting outside of the building and therefore minimising fugitive odour emissions on-site. The proposed reception building will be sealed to prevent fugitive emissions from this building All waste activities at the facility will be carried out within a ventilated building which will be extracted to an odour abatement system using carbon filtration and / or UV methodologies to remove odorous compounds.

			The building will operate under negative pressure with up to 2 air changes per hour. Ventilation pipe work installed in the headspace of the building will be connected to an industrial centrifugal fan that will draw off the warm, buoyant building air that will be generated by a combination of emissions from the feedstock materials in the intake area and from fugitive emissions from the movement of the material to the pre-treatment and digesters. The main entrances to the reception building will be fitted with rapid response roller shutter doors. A closed-door management strategy will be enforced. Treated emissions from the odour control plant in the reception building will be discharged via a 11.0m stack to enhance dispersion. The proposed location of the odour abatement system emission point within the site footprint was also designed to ensure that the distance between the emission point and the nearest sensitive receptors was maximised, thereby aiding dispersion. All feedstocks will be delivered in covered or sealed containers. Feedstock delivery times will be controlled in order to minimise truck waiting times outside of the reception building and therefore minimising fugitive odour emissions on-site. Digestate will be stabilised before storage and removal from the site to minimise odour generation. As part of the company ISO14001 standard EMS, an odour management plan will be prepared for the operational phase of the site to ensure that all odour control methods applied are sufficient and assessed at regular intervals. The plan will also outline a procedure for addressing any odour complaints.

	AOC8		**Combustion Process (Various)** The proposed biogas upgrading plant will include in line sensors for CH4, CO2, H2S and the gas will be recirculated back through the scrubbing process if it does not meet the required levels. The stack height proposed for the CHP emission point emission point has been designed in an iterative fashion to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with the EU ambient air quality standards at all off-site locations (including background concentrations for air pollutants).
	AOC9		**Dust Nuisance** Vehicles exiting the reception hall will be subjected to cleaning procedures in accordance with the DAFM Conditions Document in a designated cleaning area.

	AOC10		**Fugitive Methane Emissions** The facility will adhere to BAT principles in both its design and operational phases to enhance environmental performance. All anaerobic digestion (AD) tanks will be sealed, fitted with covers, and connected to an integrated biogas collection system to prevent methane escape. All feedstocks will be managed within a dedicated Feedstock Reception Building equipped with air handling and odour treatment systems, minimising potential emissions. Biogas storage membranes will typically be maintained at 50% capacity to provide a storage buffer under standard operating conditions. The facility will operate under a SCADA system, ensuring continuous 24/7 monitoring and control of all critical processes. To reduce residual biomethane content in digestate, the AD system will maximise hydraulic retention time, maintaining a standard HRT of 60 days. All digestate will undergo pasteurisation prior to dispatch, effectively neutralising anaerobic bacteria. This treatment ensures any subsequent breakdown of organic material is aerobic, producing CO2 rather than methane.
	AOC11		**Methane Detection Surveys:** Commissioning Survey: A comprehensive methane detection survey will be conducted during commissioning to identify and address any potential leaks before full operations commence. Annual Surveys: Methane detection surveys will be performed annually to locate any emissions. Any identified leaks will be prioritised for immediate repair.
	AOC12		The applicant's lifecycle maintenance budget will include provisions for the replacement of gas domes on a 7-10 year cycle to maintain integrity.

	AOC13		Emergency flare and PRVs will be included in the facility's routine Planned Preventative Maintenance (PPM) Plan to ensure reliable and efficient operation.
	AOC14		When market conditions allow, the applicant will begin capturing and marketing biogenic CO_2 emissions, enhancing the facility's carbon management strategy.
CH10 Noise & Vibration	**N/A**	**N/A**	There are no mitigation measures required to minimise the impact of the operational phase with the exception of planned maintenance. If applicable, replacement plant may be required to be assessed in the future.
CH11 Landscape and Visual	**N/A**	**N/A**	There are no mitigation measures required to minimise the impact of the operational phase on lanscpae and visual.

CH12 Traffic & Transport	**TT2**	**12.6.2**	**Roads Infrastructure** The operational phase of the development will generate a maximum of 62No. vehicle movements day, where 52No. are HGVs and 10No. are private vehicles and vans. The additional vehicles will represent a maximum of 10% increase in traffic but will not generate increased queues and delays along the road network in the vicinity of the site, therefore, no mitigation measure is proposed for the operational phase of the development.
CH13 Archaeology & Cultural Heritage	**N/A**	**N/A**	There are no mitigation measures required to minimise the impact of the operational phase on Archaeology and Cultural Heritage.

CH14 Material Assets	**MA9**	**14.6.2**	**Roads Infrastructure** The operational phase of the development will generate a maximum of 62No. vehicle movements day, where 52No. are HGVs and 10No. are private vehicles and vans. The additional vehicles will represent a maximum of 10% increase in traffic but will not generate increased queues and delays along the road network in the vicinity of the site, therefore, no mitigation measure is proposed for the operational phase of the development. Strong lines of communication with hauliers, strict delivery schedules and just-in-time delivery methods will be in operation to ensure no more than two trucks will visit the site at any one time.
	MA10		**Foul Water Network** A regular schedule of foul infrastructure inspection and maintenance will be carried out over the lifetime of the Proposed Development. The onsite WWTP will be subject to regular desludging and maintenance, subject to manufacturer recommendations.

	MA11		**Surface Water Network** Dedicated hard standing for off-loading areas will be established, with a minimum separation distance from adjacent water courses. Use of spill kits, bunded pallets and secondary containment units, as appropriate. All bunds sized to contain 110% of the volume of the primary storage vessel. All bunds and pipelines (foul & process) will be subject to integrity assessments every 3 years by a suitably qualified engineer. Surface water drainage features onsite will undergo routine inspection and maintenance to ensure absence of blockages or leaks. The site will be subject to annual inspections from the EPA which will assess compliance with conditions outlined in the IEL. Surface water outflows from the site will be assessed as part of these inspections to ensure emissions from the site are compliant with the license.
	MA12		**Public Water Network** Waste water, such as wash water, will be supplied from rainwater harvesting or from treated process water. This water will undergo UV treatment prior to use and storage.
	MA13		**Gas Network** There will be no impact to the existing gas network during the operational phase as Biomethane will be compressed onsite and tankered to a Grid Injection Facility.

	MA14		**Electricity Network** Utilisation of power from the public grid will serve only as a backup. Power usage for the Proposed Development under normal operating conditions will be supplied by CHP and solar PV array onsite.
	MA15		**Telecommunications Network** No mitigation measures are proposed for the operational phase of the Proposed Development. The onsite office/canteen/staff welfare facility will require a constant telecommunications connection meaning slight impacts to the existing network is unavoidable.

	MA16		**Municipal Waste** Inform staff through toolbox talks/training etc on the relevance and importance of correct waste segregation and management. Ensure waste receptacles available for the different identified waste streams to ensure proper and efficient segregation of waste onsite. Install signage to promote and encourage proper waste segregation, recycling etc. Ensure bins/skips are not allowed to overflow to prevent litter build-up onsite. Ensure all bins have lids and skips are covered when be removed offsite to prevent littering elsewhere. Ensure waste is collected by a registered vendor and disposed of at a facility licenced to take said waste. Maintain good waste records onsite to ensure all waste is accounted for.

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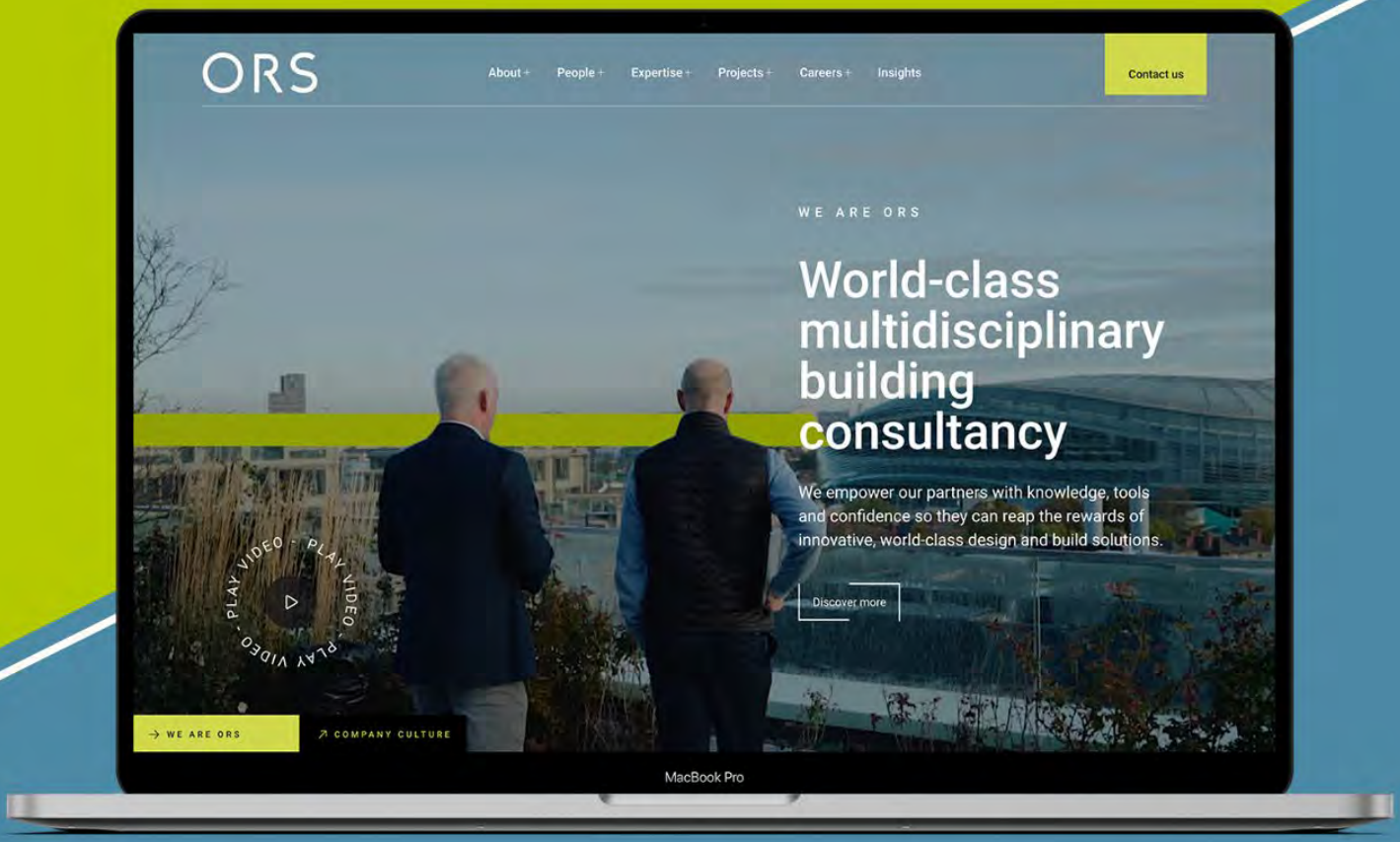

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