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 outline 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**	**5.13.2**	**Impacts to existing site biodiversity post 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 and in the separate NIS. Work Areas should be kept to the minimum area required to carry out the propsed works and this area should be clearly marked out in advance of the poposed works
	BIO 2	**5.13.2**	**Water Quality of Lower River Suir SAC** **T**he site engineer and the contractors must be made aware of the ecological sensitivity of the Proposed Development site and its connection to the Lower River Suir SAC. They must be made familiar with the mitigation measures outlined in this Chapter and the NIS report 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 3	**5.13.3**	**Impacts on existing Terrestrial Habitats & 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.
Ch 5 Biodiversity **(During Construction)**	**BIO 4**	**5.13.4.1**	**Water quality in the Tinhalla Stream which is upstream of the Lower River Suir SAC.** 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 is Hazardous or Non-Hazardous. Environment Agency et al. (2015) Guidance on the Classification and Assessment of Waste, Technical Guidance WM3.

			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. 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.
Ch 6 Population & Human Health	**PPH1**	**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.
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	**7.6.1**	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	**7.6.1**	Prior to the commencement of development 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	**7.6.1**	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	**7.6.1**	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	**7.6.1**	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.

	LSG7	**7.6.1**	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	**7.6.1**	**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.
	LSG9	**7.6.1**	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.
	LSG10	**7.6.1**	Any excess topsoil will be removed from site and disposed of appropriately.

	LSG11	**7.6.1**	Stockpiling and slight compaction of stockpiles to minimise both hydraulic and climatic erosion.
	LSG12	**7.6.1**	Running stockpiles in the direction of prevailing wind to minimise windborne erosion rates, SW-NE. (EPA, 2013).
	LSG13	**7.6.1**	Construction of silt fences around topsoil stockpiles to contain sediment run-off.
	LSG14	**7.6.1**	Minimise the export of topsoil off site by incorporating in the final landscape design.
	LSG15	**7.6.1**	Minimise handling and tracking of material to maintain optimum soil structure.
	LSG16	**7.6.1**	Landscaping to take place as soon as possible to reduce exposure of subsoil and topsoil stockpiles.
	LSG17	**7.6.1**	Works will be avoided during periods of extended rainfall.
	LSG18	**7.6.1**	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.

	LSG19	**7.6.1**	**Excavation** Excavation work will be conducted in stages to minimise the exposure of unprotected soil, subsoil and bedrock.
	LSG20	**7.6.1**	Where possible excavated subsoil material will be reworked and used on site.
	LSG21	**7.6.1**	A geotechnical investigation of the site will be required in order to assess the potential of the underlying soil, subsoil and bedrock for reuse.
	LSG22	**7.6.1**	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.
	LSG23	**7.6.1**	Light compaction of stockpiles to minimise the rate of erosion from climatic methods.
	LSG24	**7.6.1**	Stockpile heights should be kept to a minimum to ensure stockpile stability and minimise wind borne erosion.
	LSG25	**7.6.1**	Excavations will be postponed in high rainfall conditions to reduce the risk of excavation collapse and erosion to soil and subsoil profiles.
	LSG26	**7.6.1**	If extreme weather conditions are forecast high sediment stockpiles will be covered to minimise erosion.
	LSG27	**7.6.1**	Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and bedrock.
	LSG28	**7.6.1**	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.
	LSG29	**7.6.1**	All long-term soil stockpiles are to be planted with a vegetative cover to bind the soil and improve slope stability.
	LSG30	**7.6.1**	Engineered retaining walls are to be installed where required to ensure stability of contiguous and Proposed Development topography.
	LSG31	**7.6.1**	“Mole Plough” installation method will be utilised to install the stormwater discharge pipe to the Tinhalla stream. This will limit trenching requirements and reduce the risk of sediment laden run-off.

	LSG32	**7.6.1**	The timing of installation of the stormwater discharge pipe into the Tinhalla stream 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 headwall construction should be supervised by an Ecological Clerk of Works (ECoW).
	LSG33	**7.6.1**	**Soil Compaction** Construction of a hardcore gravel access road on and around the site.
	LSG34	**7.6.1**	Confine site traffic to designated routes.
	LSG35	**7.6.1**	Minimise traffic flows on site and establish a construction stage parking compound.
	LSG36	**7.6.1**	Avoid the use of oversized machinery when and where possible.
	LSG37	**7.6.1**	Prevent movement of vehicles on site during and after periods of rainfall.
	LSG38	**7.6.1**	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.
	LSG39	**7.6.1**	Works will be avoided during periods of extended rainfall.
	LSG40	**7.6.1**	**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 Tinhalla Stream. 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.

	LSG41	**7.6.1**	An interceptor trench will be installed in front of the silt fence.
	LSG42	**7.6.1**	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.
	LSG43	**7.6.1**	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.
	LSG44	**7.6.1**	Compacting of stockpiles will reduce the rate of airborne and hydraulic erosion.
	LSG45	**7.6.1**	Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site.
	LSG46	**7.6.1**	Silt Fences to be erected where excavation works are required in close proximity to water features and along depressions in land where there's increased surface water flow rates.
	LSG47	**7.6.1**	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.
	LSG48	**7.6.1**	A temporary drainage system will be established complete with a settlement pond to remove contaminants from run-off, prior to discharge.
	LSG49	**7.6.1**	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.
	LSG50	**7.6.1**	**Concrete** 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.
	LSG51	**7.6.1**	The concrete washout skip is to be located to the east of the site, where the overburden is greater.
	LSG52	**7.6.1**	Excavations lined with an impermeable liner are not permitted as concrete washout bays.

	LSG53	**7.6.1**	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.
	LSG54	**7.6.1**	Best practice in bulk-liquid concrete management should be employed on site addressing pouring and handling, secure shuttering, adequate curing times etc.
	LSG55	**7.6.1**	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.
	LSG56	**7.6.1**	Activities which result in the creation of cement dust will be controlled by dampening down the areas.
	LSG57	**7.6.1**	Raw and uncured waste concrete will be disposed of by removal from the site.
	LSG58	**7.6.1**	**Construction Contaminants** Fuels, oils and other environmental deleterious chemicals are to be stored in a bunded well-ventilated chemical stores.
	LSG59	**7.6.1**	Use of such chemicals and fuels is to be contained to bunded areas, where possible.
	LSG60	**7.6.1**	Fuel bowsers to be located in bunded areas which can cater for 110% of the primary vessel capacity.
	LSG61	**7.6.1**	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.
	LSG62	**7.6.1**	Oil spill containment kits are to be situated near areas of potential spills.
	LSG63	**7.6.1**	Regular inspections carried out on plant and machinery for leaks and general condition.
	LSG64	**7.6.1**	Use of ready-mixed supply of wet cement products.
	LSG65	**7.6.1**	Scheduling cement pours for dry days.
	LSG66	**7.6.1**	Maintenance and repair works will be carried out at least 10m from any collection of surface water.
	LSG67	**7.6.1**	No refuelling will be undertaken within 50m of the Tinhalla Stream.

LSG68	**7.6.1**	Ancillary machinery equipment such as hoses, pipes and fittings which contain hydrocarbons will be stored within a bund or drip tray.
LSG69	**7.6.1**	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.
LSG70	**7.6.1**	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.
LSG71	**7.6.1**	**Importation of Contaminated Materials** All material will be sourced and transported by registered suppliers.
LSG72	**7.6.1**	All materials will be inspected prior to acceptance on site.
LSG73	**7.6.1**	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”.
LSG74	**7.6.1**	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.
LSG75	**7.6.1**	**Excavation of Contaminated Soils** All excavated materials will be visually assessed for contamination.
LSG76	**7.6.1**	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	**8.6.1**	**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.

	HH3	**8.6.1**	**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	**8.6.1**	**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 to take place as soon as possible to reduce weathering. Further trial pits are recommended pre-construction to determine soil depth to the east/northeast of the Proposed Development. Installation of impermeable liners is recommended under the attenuation ponds.
	HH6	**8.6.1**	**Excavation of Contaminated Soils** Procedure in place for incidence of contaminated land within CEMP Contaminated soils encountered to be tested, quantified, segregated and transported for disposal by a licenced contractor

	HH7	**8.6.1**	**Conversion of Permeable Soils to Hard standing** The rate of discharge to the stream will be restricted to a maximum permissible rate of 17.8 lit/sec. 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. Floor levels upstream of the storage areas are at least 500mm above the top water level in the detention basins for the 100-year event.umps in gullies and manholes collect silts in run-off from roads. Overtopping does not occur during rainfall events ranging from 30 minutes to 1440 minutes. No risk of flooding of adjacent areas. Attenuation Ponds will accommodate the total catchment area capacity and will provide a minimum storage capacity of 1107m3 (designed to accommodate the estimated rainfall events)
	HH8	**8.6.1**	**In-stream works (Culverted Drain)** In stream works should adhere to Inland Fisheries Ireland, Guidance Document entitled: "Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016)" Contact should be made with IFI at the earliest possible stage regarding the installation of the culverts. The culverts will be designed and executed in an environmentally sensitive manner.
Ch 9 Air Odour & Climate	**AOC1**	**9.8**	**Fuel Storage** Temporary Fuels used during construction will be stored in sealed containers.

	AOC2	**9.8**	**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	**9.8**	**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	**9.8**	**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	**9.8**	**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.

	AOC6	**9.8**	**Constructing and operating site access roads** A speed restriction of 15 km/hr will be applied as an effective control measure for dust for onsite vehicles using unpaved site roads. Access gates to the site shall be located at least 10m from sensitive receptors, where possible Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only. Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust. A wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. Public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.
Ch 10 Noise & Vibration	**NV1**	**10.7**	Construction phase mitigation measures as outlined in the CEMP.
Ch 11 LVIA	**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.
Ch 12 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. 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.

Ch 13 Archaeological & Cultural Heritage (Pre Construction)	**ACH 1**	**13.4**	It is recommended that a programme of archaeological testing be carried out 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	**13.4**	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.
	ACH 3	**13.4**	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 4	**13.4**	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.
	ACH 5	**13.4**	In addition, the report on the results of the test excavation and an impact statement will be submitted to the planning authority to inform the archaeological site strategy. Where archaeological material is identified, the developer will submit an archaeological mitigation strategy and a detailed method statement for written agreement with the planning authority 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.
Chapter 13 Archaeology & Cultural Heritage	**ACH 6**	**13.4**	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.
Ch 14 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 to underground services (gas, telecommunications, water) are established.

	MA2	**14.6.1**	**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	**14.6.1**	**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	**14.6.1**	**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	**14.6.1**	**Gas Network** All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations.
	MA6	**14.6.1**	**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	**14.6.1**	**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	**14.6.1**	**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)

Operational Phase			
EIAR Chapter No.	**Mitigation Ref.**	**EIAR Section Ref**	**Description of Mitigation/Monitoring measure**
Ch 5 Biodiversity	**BIO 6**	**5.13.5.1**	**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.
	BIO 7	**5.13.5.2**	**Uncontrolled releases to the Tinhalla 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 process water 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 8	**5.13.5.3**	**Harmful effects of Landscaping and Lighting on Biodiversity** The treelines and 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 Planting should focus on providing year-long interest for pollinators and should be in accordance with the Landscaping 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. 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. Bat boxes could be installed around the Proposed Development.
			When erecting bat boxes externally put up a minimum of three boxes facing in different directions to provide a range of temperature conditions. The use of herbicides within the Proposed Development 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 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. 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 towards mature vegetation or the Tinhalla Stream.

			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. Lighting shall be directed downwards away from the treetops and shall not illuminate the Tinhalla Stream or vegetation along its banks. 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.
	BIO 9	**5.13.5.6**	**Land and water pollution from use of the Biobased Fertiliser by Customer Farmers** 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 The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm. Records will kept by the farmer and routinely provided to the Applicant for verification.
Ch 6 Population & Human Health	**PHH 4**	**6.7**	**Impacts to Population & Human Health during the Operational Phase** No mitigation measures are required during the operational phase.
Ch 7 Land Soils & Geology	**LSG77**	**7.6.2**	**General Mitigation Measures** An Environmental Management System (EMS) will be prepared and implemented by the facility operating company
	LSG78	**7.6.2**	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
	LSG79	**7.6.2**	**Uncontrolled Releases and Spillages** Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses.
	LSG80	**7.6.2**	Use of spill kits, bunded pallets and secondary containment units, as appropriate.
	LSG81	**7.6.2**	All bunds sized to contain 110% of the volume of the primary storage vessel.
	LSG82	**7.6.2**	Environmental Management Plan (EMP) to include site specific standard operating procedures pertaining to waste management and emergency response.
	LSG83	**7.6.2**	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 via the attenuation ponds with all areas, with the exception of the roofs, being directed through Class 1 petrol/oil interceptors before passing through the attenuation ponds prior to discharge.
	LSG84	**7.6.2**	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.
	LSG85	**7.6.2**	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.
	LSG86	**7.6.2**	**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).
	LSG87	**7.6.2**	The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm.
	LSG88	**7.6.2**	Application of biobased fertiliser to be conducted in compliance with the Nitrates Action Programme (e.g. prohibited periods and nitrogen application rates).
	LSG89	**7.6.2**	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.
	LSG90	**7.6.3**	**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	**HH9**	**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
	HH10	**8.6.2**	**Contaminated Run-off**

			Compared to untreated manures and slurries, biobased fertiliser poses a lower risk of nutrient leaching into watercourses. Design criteria adopted for the development include: Drainage systems will be designed to attenuate excess surface water runoff with suitable storage volumes Sumps in gullies and manholes collect silts in run-off from roads Where feasible, run-off will discharge to filter drains. The filter material will treat run-off before its entry to pipes Class 1 discharge bypass separator treats surface water for hydrocarbons run-off before its discharge to the detention basin All surface water run-off will discharge to the detention basin. The floor of the basin will be shaped to allow for the retention of silts in the basin The digestion process area will be completely bunded and constructed to Eurocode standard (BS EN 1992-3)
	HH11	**8.6.2**	**Foul Water** All sewage infrastructure to be installed in accordance with the relevant industry standards and pressure tested/CCTV surveyed prior to commissioning to ensure absence of defects Programme of inspection and maintenance to ensure any defects are repaired The wastewater treatment plant will comprise a secondary treatment system, followed by a soil polishing filter. The overburden consisting of light black CLAY/ TILL is determined to be excellent overburden available to support Groundwater Protection Responses (GWPR). The trenches will be dug 500mm wide and will achieve a minimum separation distance between the trenches of 2m spacing (2.5m centre to centre) and to a depth of 850mm. 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.
	HH12	**8.6.2**	**Increased Groundwater Vulnerability**

			The tank farm area will be completely bunded and constructed to Eurocode standard (BS EN 1992-3:2006) 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.
	HH13	**8.6.2**	**Fire and Resultant Water** A Firewater Risk Assessment will be undertaken, subject to requirements of the EPA. Adequate firewater retention capacity is installed and maintained on-site in the event of a worst-case scenario fire event. All retention infrastructure systems will be automatically activated in the event of a fire alarm being triggered.
	HH14	**8.6.2**	**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.
	HH15	**8.6.2**	**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	**8.6.2**	**Attenuation Pond** 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 pond. Impermeable membrane liner will be installed under the attenuation ponds to prevent percolation of contents into the underlying regionally important karst aquifer.
	AOC7	**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.
	AOC8	**9.8**	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.
	AOC9	**9.8**	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
	AOC10	**9.8**	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.
	AOC11	**9.8**	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 6.0m 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.
	AOC12	**9.8**	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.
Ch 10 Noise & Vibration	**NV3**	**10.7.1**	The impact assessment herein adopts a worst-case with all noise sources operating simultaneously and continuously. In reality the noise levels and the impact will be less. There are no mitigation measures therefore required to minimise the impact of the operational phase with the exception of regular maintenance of the plant and suitable assessment of any replacement plant that may be required in the future.
	TT2	**12.6.2**	The operational phase of the development will generate a maximum of 36 vehicles a day, where 26 are HGVs and 10 are private vehicles and vans. The additional vehicles will represent a maximum of 4.95% increase in traffic and 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.
	MA9	**14.6.2**	**Roads Infrastructure** The operational phase of the development will generate a maximum of 36 vehicles a day, where 26 are HGVs and 10 are private vehicles and vans. The additional vehicles will represent a maximum of 4.95% increase in traffic and will not generate increased queues or delays along the road network in the vicinity of the site, therefore, no mitigation measures are proposed for the operational phase of the development.
Ch 14 Material Assets	**MA11**	**14.6.2**	**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	**14.6.2**	**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	**14.6.2**	**Gas Network** The GUI and gas connection pipeline will be installed and maintained by Gas Networks Ireland. All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations.

	MA14	**14.6.2**	**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	**14.6.2**	**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	**14.6.2**	**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.