May 2025

Decommissioning Plan

Proposed 110kV Substation and Underground Grid Connection at Grangeford, Co. Carlow

On behalf of
Prt Solar Limited

MALONE O'REGAN ENVIRONMENTAL

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Decommissioning Plan

Proposed 110kV Substation and Underground Grid Connection at Grangeford, Co. Carlow,

Grangeford, Co. Carlow

Prt Solar Limited

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1 INTRODUCTION

Malone O'Regan Environmental ('MOR Environmental') has been commissioned by Prt Solar Limited ('the Applicant') to prepare a Decommissioning Plan in respect of a proposed 110kV substation ('henceforth referred to as the 110kV Substation') and associated 110kV underground cable ('henceforth referred to as the UGC') connecting the proposed to the existing ESB 220kV Kellistown Substation and all associated works ('henceforth referred to as the Proposed Development').

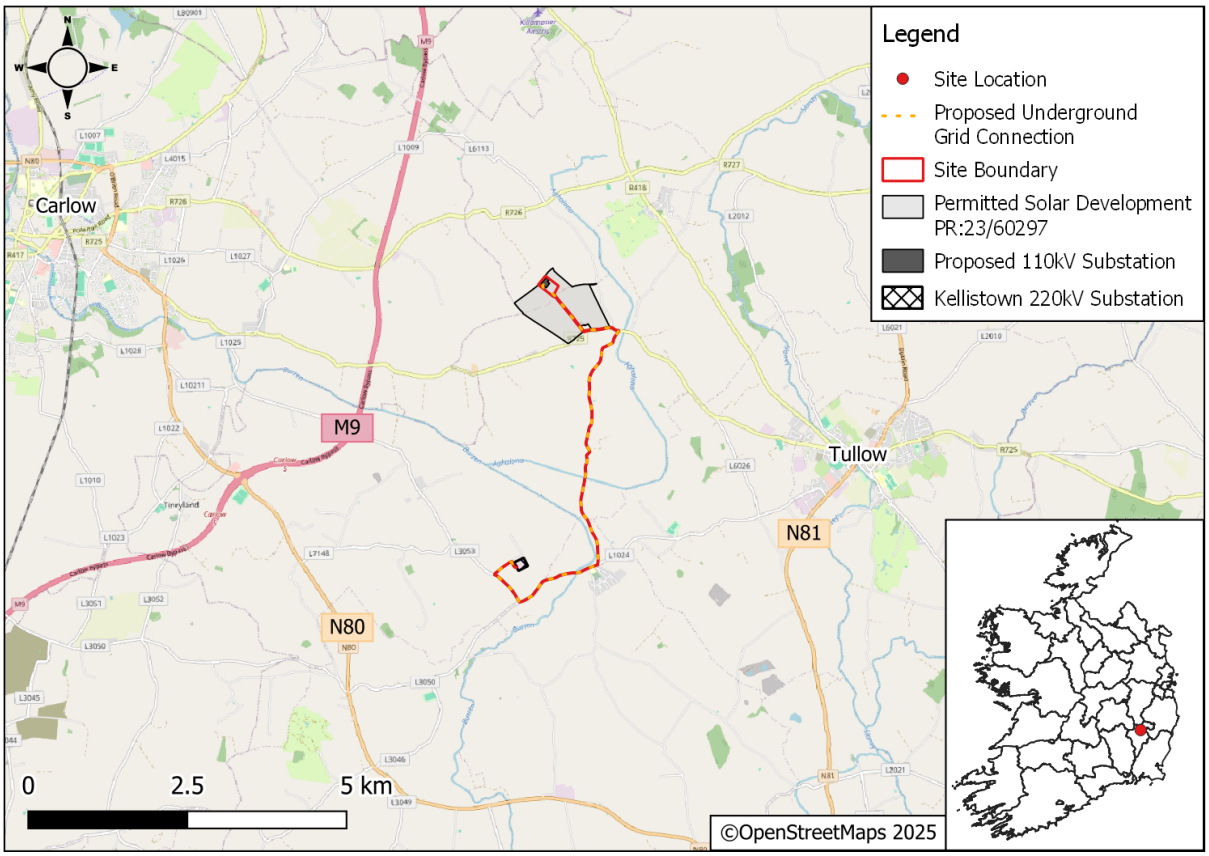
The Proposed Development will form a major new strategic connection node to the national grid within County Carlow. The Proposed Development will transmit power from the permitted Grangeford Solar Farm (Planning Ref: 23/60297; which amended previous permission Reg. Ref: 21/23 and ABP-309987-21) (henceforth referred to as the 'Permitted Solar Development') via an UGC, which will connect into the existing ESB Kellistown 220kV substation located circa ('ca.') 3.4km (direct distance) southwest of the Permitted Solar Development.

1.1 Site Location

The proposed 110kV Substation will be located on a Site that is ca. 1.7 hectares ('ha') in size and located in the townlands of Grangeford Old and Friarstown, Co. Carlow (OS ITM Reference 076106 336077) as outlined in Figure 1-1 ('the Site').

The proposed 110kV UCG will be ca. 8km in length, primarily along public roads, and will traverse through the townlands of Friarstown, Grangeford Old, Grangeford, Moanalow, Glenoge, Rathnashannagh, Inchisland or Moatalusha, Rathtoe, Kellistown East, Ballycurragh and Kellistown West.

Figure 1-1: Site Location



1.2 Purpose of the Decommissioning Plan

The purpose of this Decommissioning Plan is to describe how the Developer proposes to restore the Site to its former agricultural use post-operation. This document provides an overview of the anticipated activities during the decommissioning phase and outlines the mitigation measures to address any potential negative environmental effects as a result of these activities.

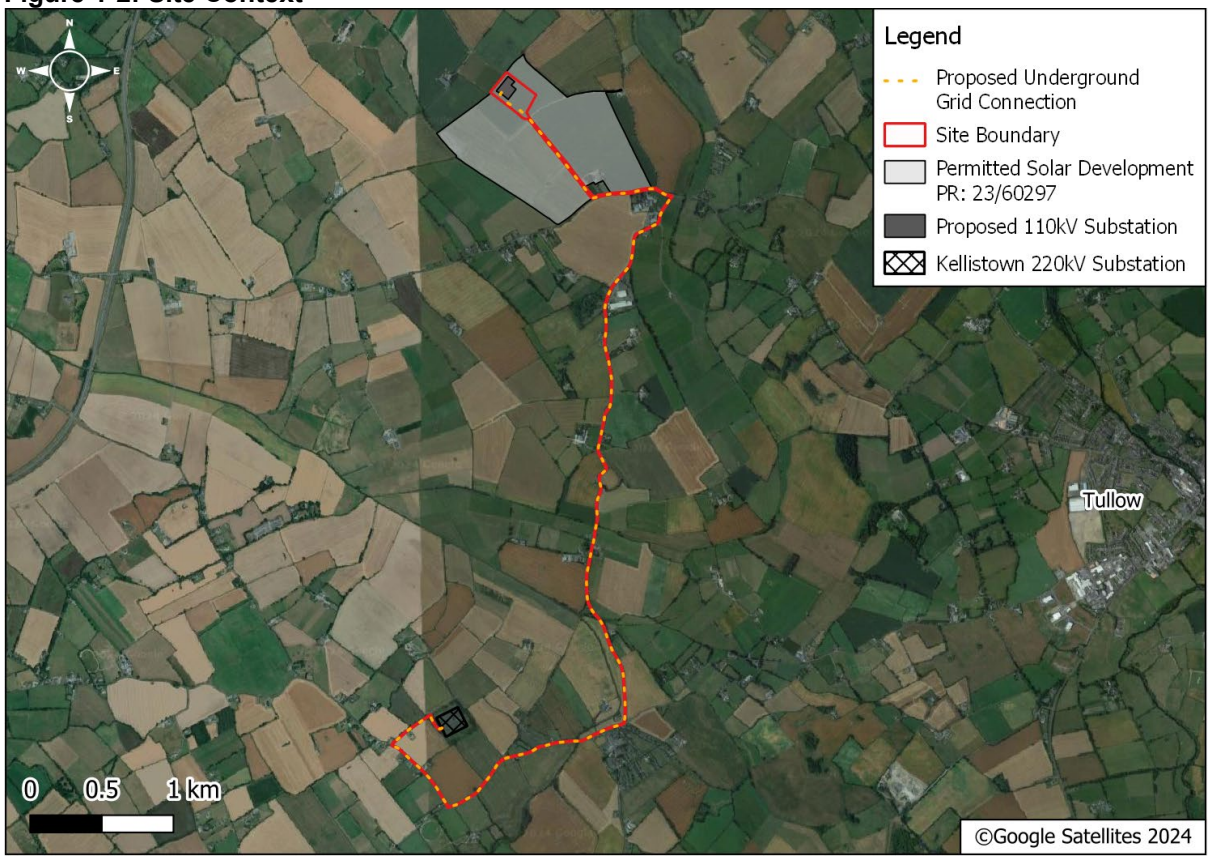
1.3 Site Context and Description

The Site is located within a predominately rural landscape within the townlands of Friarstown Grangeford Old, Grangeford, Moanalow, Glenoge, Rathnashannagh, Inchisland, Rathtoe, Ballycurragh, Kellistown West and Kellistown East, Co. Carlow. The Site is surrounded by agricultural grassland, with scattered residential properties and farmyards. The Killerig Golf Club is located ca. 1km northeast of the Site at the closest point. Refer to Figure 1-2.

The Site is 1.7ha in size, located in predominantly agricultural land, which at the time of writing this report is under arable crop with hedgerow / treeline forming the northern perimeter of the Site. The Site is accessed via the R725 and the L6113.

The proposed 110kV UGC will be situated along existing internal access tracks / agricultural land, with the majority located within existing public road infrastructure, both regional and local, before connecting to the existing ESB 220kV Kellistown Substation.

Figure 1-2: Site Context



1.4 Background

1.4.1 Permitted Planning Permissions

The Proposed Development will be critical infrastructure that will be intrinsically linked to both permitted and planned renewable energy projects, comprising both solar and battery energy storage developments. Details of these projects are described below. These renewable

energy projects will not be able to function as standalone developments as they will be reliant on connections to the Proposed Development in order to connect to the national grid.

It is anticipated that, subject to obtaining consent for the Proposed Development, the proposed 110kV substation will be developed in lieu of a previously permitted 38kV substation granted by Carlow County Council (Planning Ref: 2360297). The Proposed Development will connect the Permitted Solar Development to the national grid. It is envisioned that the Proposed Development will be constructed in conjunction with the Permitted Solar Development as part of one development (henceforth known as the 'Overall Development'). Please refer to Figure 1-3.

Carlow County Council Planning Reg: 21/23 (ABP Ref No. 309987-21) – Granted

> *10 Year permission for development consisting of the construction of a Solar PV development comprising photovoltaic panels laid out in arrays over a total development site area will be ca. 65.6 ha, the construction of a 38kV substation (ca 114.4m^2 x 4.75 tall) a transformer unit (ca. 18m^2 x 4m tall) and associated bund (ca. 55m2), along with ancillary development including; 24 no. Power Hubs (ca. 15.25m^2 x 2.4m) which incorporate an inverter and a transformer, 1 no. single storey communications building (11.1m^2 x 2.5m), 1 no. single storey client side sub-station building (15.25m^2 x 2.9m), 1 no. single storey equipment storage building (7.5m^2 x 2.7m), 10 no. CCTV cameras mounted on 4m high poles, perimeter security fencing, site access, site egress and all ancillary works.*

A Notification to Refuse Permission was issued by Carlow County Council on the 23rd March 2021 due to a limitation on MW's outputs stipulated in their Development Plan at that time. A first party appeal was submitted to An Bord Pleanála on 17th May 2021. Planning was granted by An Bord Pleanála (ABP Ref: 309987-21) on the 26th October 2021.

This planning permission was superseded by Planning Ref: 23/60297 below.

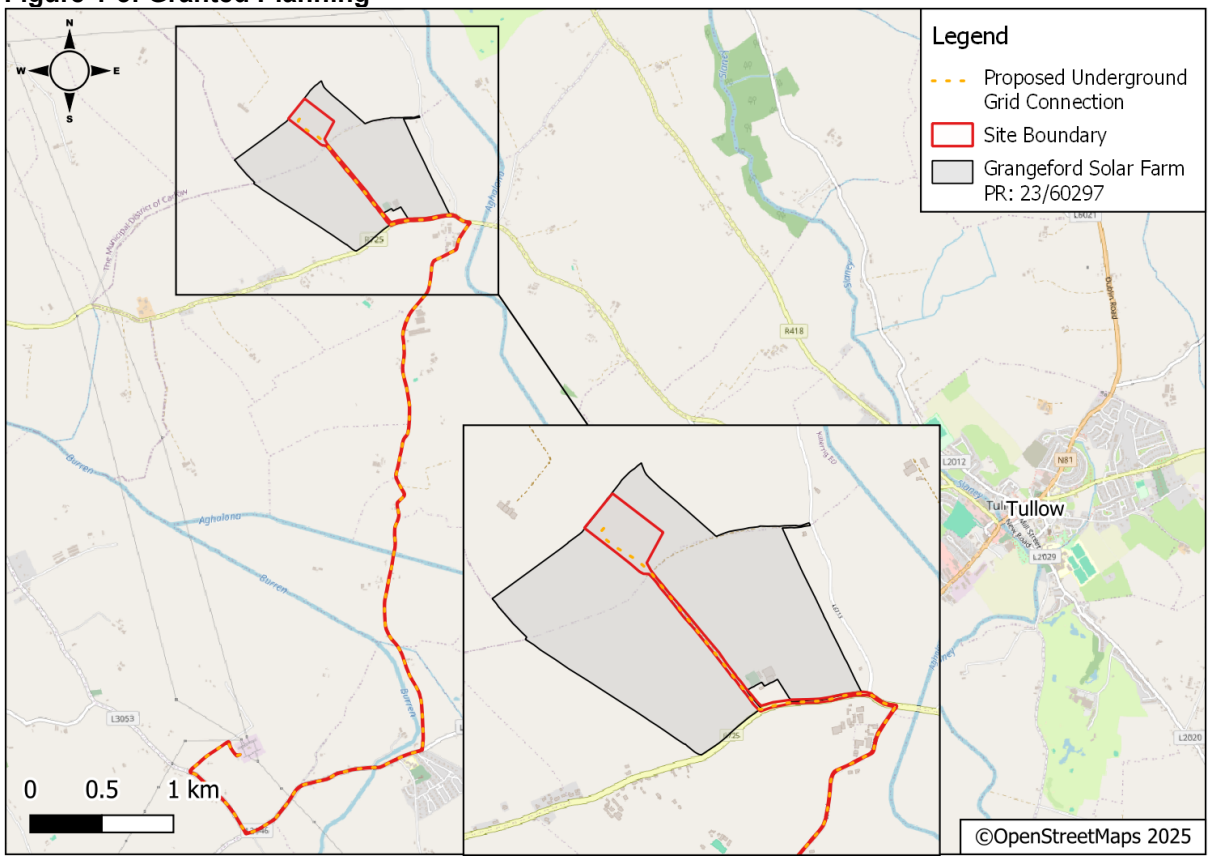
Carlow County Council Planning Reg: 23/60297– Granted

> *10-year permission. The development will consist of the construction of (i) a Solar PV development comprising photovoltaic panels laid out in arrays over a total development site area of ca. 91.2ha, (ii) the construction of a 38kV substation building ((6.1m (h) x 20.9 (l) and 7.3 (w)) and associated compound area, a transformer unit (ca. 6m x ca. 3.6m) and associated bund, (iii) 352 number Battery Energy Storage System units comprising 22 modules (ca. 21.9m x ca.5.2m) each with 16 number cabinet units within each module and (iv) all ancillary development including 15 number transformer integrated units (ca. 10.5m x ca.2.7m), 12 number inverter units (ca. 6.0m x ca.2.4m), 7 number CCTV cameras mounted on 4m high poles, a 3m high acoustic barrier, with berm and fencing, perimeter security fencing, site access, site egress and all ancillary works and services. The development will have a 40-year operational lifetime.*

This planning permission superseded the previously permitted solar development (Planning Ref: 21/23; ABP Ref No. 309987-21). Carlow County Council granted the Permitted Solar Development on the 24th September 2024.

Figure 1-3 illustrates the Permitted Solar Development permission boundary and the Proposed Development boundary.

Figure 1-3: Granted Planning



2 DECOMMISSIONING

Decommissioning consists of the removal of all components associated with the Proposed Development, management of excess wastes materials and the restoration of the project lands, as applicable.

It is proposed that there will be a single decommissioning programme for the Proposed Development and the Permitted solar PV and BESS Development (Planning Ref: 23/60297).

2.1 Description of the Proposed Development

The Proposed Development will consist of the construction of a 110kV electrical substation and a 110kV underground cable connection.

2.1.1 110kV Substation

The proposed 110kV electrical substation in Friarstown, on a site of ca.1.7ha will consist of:

- 1 no. electrical substation compound and access road, palisade fencing and gates, measuring 100.75m x 126.75m;
- 1 no. electrical substation / IPP control building measuring 10.74m x 20.15m and 6.920m in height;
- 1 no. Eirgrid switch room building measuring 18m x 25m and 8.55m in height;
- 6 no. lightning protection monopoles measuring up to 18m in height;
- Associated electrical apparatus, plant and equipment; overhead and underground electrical and communications cabling and ancillary works;
- Upgrading of existing access road;
- Temporary site construction compound; and
- All associated ancillary works above and below ground including landscaping.

The Substation is designed to the latest Eirgrid Standard, comprising a 110kV AIS 2 Bay Station extendable to 4 Bay and 8 Bay configuration. Eirgrid recommends this design as it facilitates future expansion and improving the overall availability of renewable energy on the grid. This design optimises resources in the initial substation development and reduces the downtime and impact on the grid over its lifecycle, thus facilitating future grid connections and improving the effectiveness of the substation. This substation design will improve the availability of customer renewable energy connections on the system and enhance the integration of renewable sources, thus supporting the industry's collective goal of a sustainable energy future

This 110kV substation will be designed to connect the Permitted Development to the national grid. The substation will serve the permitted solar PV development and supersede the permitted 38kV substation.

As a 110kV substation, the proposed substation will be a "node" and become part of the transmission system and will be connected as a spur node to the existing ESB 220kV Kellistown Substation, located ca. 2km south, interconnected by the proposed underground 110kV cable.

CCTV

The on-site CCTV would be remotely monitored via a 24/7 operational team who would alert all relevant personnel in the event of a break-in or vandalism at the Site. The cameras will only be focused along the fence line and will not be focused on any neighbouring dwellings.

Fencing

A perimeter fence which will be installed to provide security, restrict access, and will be deer proof.

Lighting

Emergency lighting only will occur as part of the Proposed Development.

2.1.2 110kV Grid Connection

The proposed 110kV UGC will be ca. 8km in length. The UGC will interconnect the Proposed 110kV substation to the existing 220kV ESB Kellistown substation.

The UGC will consist of:

- Three 160mm diameter HDPE power cable ducts;
- Two 125mm diameter HDPE communications duct; and,
- One 63mm diameter earth continuity duct to be installed in an excavated trench, typically 825mm wide by 1,315mm deep.

Variations on this design to adapt to bridge crossings, service crossings and watercourse crossings, etc. The power cable ducts will accommodate one power cables per duct. The communications duct will accommodate a fibre cable to allow communications between the Grangeford Solar Farm Substation and Kellistown 220kV substation. The inclusion one earth continuity conductor duct will also be required.

The 110kV UGC route will exit the proposed 110kV Substation and traverse in a southerly direction within the permitted development (PR 2360297) along existing internal access tracks and exit directly onto the R725. The UGC will then follow the R725 in an easterly direction for ca. 550m before turning onto the local road.

The UGC will continue in a southerly direction to the existing ESB 220kV Kellistown Substation. The cable will be installed in a cable trench as per industry standards, including ducting, fibre optic conductor, insulated earthing conductor where required and link boxes at some jointing locations. The ESB will ultimately be responsible for ensuring that the most appropriate connection option will be selected. This asset, together with the substation, will be owned and operated by the Independent Power Producer ('IPP').

Full details of the proposed cable route development are provided within the TLI Group Construction Methodology Report, which will be submitted in support of this application.

2.1.3 Permitted Development (Planning Ref: 2360297)

The components of the permitted development that will require decommissioning include:

- Solar PV panels laid out in arrays across the Site;
- 12 No. inverter units (ca. 6.05m x ca.2.45m);
- 352 No BESS Units – Comprised of 22 Modules (ca. 21.9m x ca.5.2m) comprised of 16 number cabinet units within each module (352 total cabinets);
- 15 No. transformer integrated units (PCS Hubs) (ca. 10.5m x ca. 2.7m);
- 3m high acoustic barrier, comprised of berm and fencing;
- 7 No. CCTV cameras mounted on 4m high poles;
- Perimeter security fencing (2m high); and,
- All associated ancillary development.

All potential negative environmental effects from the decommissioning works will be mitigated through established measures. These measures include, but will not be limited to;

- The use of erosion and sediment control measures;
- Maintenance of all existing buffers (hedge / treeline, drainage ditches etc.);
- Timing of decommissioning works to ensure that they do not interfere with wildlife breeding / nesting times; and,
- Measures which will rapidly establish a vegetative cover on any disturbed areas.

This decommissioning plan is based on current procedures and experience. However, at the time of decommissioning, all procedures will be re-evaluated to ensure that all decommissioning activities will be in accordance with all applicable guidance pertaining at that time.

2.2 Decommissioning Fund

At the cessation of electricity generation by the solar farm and within its life-span, the Proposed Development and the connected solar and battery storage facility, will be fully decommissioned and the land reinstated to its former agricultural use within 12 months. The solar farm produces clean and safe energy. It collects and converts light directly into electricity, hence there will be no hazardous waste generated or the need for complex environmental remediation. Project decommissioning is a simple and swift process owing to the method the modules and supporting structures are installed onsite. Broadly speaking, project decommissioning comprises of the dismantling and removal from the Site of all solar farm infrastructure and components. The following principles will be applied in decommissioning:

- Revenues from the sale of dismantled raw materials per weight (mainly aluminium, steel and copper) will outweigh decommissioning and restoration costs. Therefore, no reserve account needs to be set up to ensure enough financial means are available to restore the Site;
- PV panels require more special treatment: they need to be dismantled in specialised facilities to recycle the materials which are mainly glass, aluminium and silicon. Therefore, panels shall only be sourced from manufacturers which are members of the PVCYCLE initiative. This approach will ensure that panels receive a proper recycling treatment at the end of the lifetime of 35 years; and,
- The panels' supporting structure will consist of galvanised steel design for a lifetime of 35 years. No concrete shall be used for the foundations. Depending on the soil conditions, either earth screws or rammed profiles will be used to an approximate depth of 2m below ground level.

In order to alleviate any concerns that the Council may have in relation to these decommissioning works, prior to the commencement of development, the developer shall lodge with the Planning Authority a cash deposit, a bond of an insurance company, or such other security as may be acceptable to the Planning Authority, to secure the satisfactory reinstatement of the Site on cessation of the project coupled with an agreement empowering the Planning Authority to apply such security or part thereof to such reinstatement.

The form and amount of the security shall be agreed in writing between the Planning Authority and the developer or, in default of the agreement, shall be referred to An Bord Pleanála for determination.

2.3 Timeframe

The proposed 110kV substation is expected to be operational in accordance with the Permitted Development. The Permitted Development has been granted an operational

lifespan of 40 years. On cessation of activities, the Permitted development will either be redeveloped or the site will be redeveloped in an alternative form.

It is not anticipated that the 110kV substation will be decommissioned within this timeframe. Any decommissioning of the 110kV infrastructure will be undertaken only following written confirmation and formal instruction from EirGrid or the relevant statutory body.

Decommissioning activities will be carried out in accordance with the timeframes outlined within the applicable planning conditions.

While not expected and considered extremely unlikely, in the event that the construction or operation activities cease prior to the project completion, with no expectation of construction to restart, the development will be decommissioned as described in this report.

2.4 Equipment Dismantling and Removal

At the end of the Permitted Development's lifetime, the Permitted Development will be disconnected from the ESB power grid. However, depending on energy requirements in 40 years, a potential option may be to re-power the solar farm and continue operations. If such a scenario arises the need for the proposed decommissioning works will be negated.

As part of the Permitted Development, the decommissioning tasks and removal of all components from the leased land will be completed within approximately twelve (12No.) months of the cessation of electricity generation and the Site will be returned to agricultural usage. All structures will be completely dismantled and removed (including underground electrical interconnection and distribution cables) as detailed below.

Given the nature of the Permitted Development, it is considered highly unlikely that any adverse effects to the environment would occur as a result of decommissioning works. Regardless, decommissioning works will be carried out in accordance with best practice guidelines and the applicable legalisation at the time of decommissioning.

2.4.1 PV Modules and Supporting Structures

Each individual PV module and associated equipment will be disconnected from the electrical system and the supporting structures will be dismantled. As the PV modules are removed, they will be placed in containers to be shipped for recycling and material re-use via a recycling facility or sent for use in new solar modules or other solar products.

The supporting PV mounts will then be pulled from the ground by a small piling rig and will be removed and recycled off-site by an approved metals recycler.

In regard to the areas of Ground-Mounted Ballast Design structures, no groundworks will be carried out. All decommissioning works will be non-intrusive, and no earthworks of any kind will be carried out within the zones with ballast PV panels to ensure no subsurface impacts on any of the potential archaeological features.

2.4.2 Inverter Units and Transformers

All inverter and transformer units will be disconnected from the electrical system and removed from the Site. All components will be recycled off-site by an approved recycler.

2.4.3 110kV Substation

It is not anticipated that the 110kV substation will be decommissioned within this timeframe. Continued use of the 110kV substation will be confined to the compound area and access road only.

In the event that part of, or, the entire proposed 110kV substation is to be decommissioned, all structures, equipment and materials to be decommissioned will be removed and the land reinstated fully to agricultural use or another appropriate use.

Any decommissioning of the 110kV infrastructure will be undertaken only following written confirmation and formal instruction from EirGrid or the relevant statutory body.

2.4.4 Battery Storage

The removal of the battery storage facility and associated infrastructure from the Permitted Development will require the removal of all internal Information Technology ('IT') from the building. The removal of the battery storage will principally be the reversal of its construction.

A fixed crane and articulated Heavy Goods Vehicles ('HGVs') will be required for the removal of the battery storage containers, container switch room and containerised control room within the battery storage facility. These battery containers will be removed from the Site and the contents recycled or repositioned to an alternative site, if possible.

The cement used to secure the building foundations will be broken up and loaded onto a truck for removal from the Site. These materials will not involve significant volumes and will be transported to a licensed waste transfer station for appropriate disposal or sold as recycled concrete aggregate. Ground levels will be smoothed, compressed, and levelled and restored to pre-development condition.

2.4.5 Electrical Cabling

The high voltage connection, underground electrical interconnection and distribution cables will be disconnected, removed and recycled offsite by an approved recycling facility.

All cabling will be either sent for recycling at a licensed recycling facility for further use or re-used where appropriate. In the event that cables are not in a condition to be re-used; they will be disposed of at an appropriate licensed waste transfer facility.

Underground cables will be disconnected from the local electricity distribution network and lifted from the trenching. Following the removal of the cable, trenches and ground surfaces will be immediately backfilled, compressed, and restored to their former condition.

110kV underground cabling along the grid route will be left in-situ where required as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance for an underground element that is not visible with no environmental impact associated with leaving the ducting in-situ.

All security systems, CCTV, associated supports and wiring shall be dismantled and removed offsite for recycling by an approved recycling facility.

2.4.6 Other Components

Any above ground lines and poles that are not owned by ESB or EirGrid will be removed along with associated equipment and holes will be infilled.

All electrical, electronic devices including switchgear and metering equipment will be removed and recycled off-site by an approved metals recycler. All fences surrounding the Site will be dismantled and removed off-site for recycling by an approved metals recycler.

2.5 Drainage

Any drainage ditches which are identified as being damaged following the removal of PV modules and electrical materials from the Site will be repaired following the completion of the decommissioning works.

2.6 Noise

The decommissioning works are not envisioned to create significant adverse noise effects; however, there is a possibility for temporary increases in noise levels within the immediate vicinity of the Site. Overall, noise impacts during decommissioning will be localised and temporary in nature.

In addition, the noise emissions during decommissioning shall not exceed a $L_{Aeq,T}$ noise level of 65dB 3-metre from the facade of any occupied residential dwelling.

All decommissioning works will take place during similar hours to those of the construction phase - to 08:00 to 20:00 Monday to Friday and from 08:00 to 18:00 on Saturday. No decommissioning works will be undertaken outside these hours or on Public Holidays or at night-time except without the prior agreement of the planning authority.

2.7 Traffic

The traffic numbers and movements will be similar to those expected during the construction phase of the proposed development. The access routes utilised during the decommissioning phase of the proposed development will be the same as those used during the construction phase.

2.8 Waste

All waste generated will either be re-used, sent to an approved / licenced recycler, or returned to the manufacturer for appropriate recycling / disposal. All components of the development will be re-used or recycled as much as reasonably practicable.

All residual waste will be removed by a licenced contractor and transported to licenced waste facility. Due to the nature of the Proposed Development, there will be a very limited volume of residual (non-recyclable) waste generated.

2.9 Landscape

Overall, it is not anticipated that the removal of the structures and compounds within the Site will leave any open excavations; however, where necessary, the ground will be re-graded to the original contours using onsite materials.

2.10 Cultural Heritage

As part of the decommissioning phase, there will be no subsurface impacts on any of the potential archaeological features as outlined in the Archaeological Impact Assessment (‘AIA’).

As part of the decommissioning plan of the Permitted Development, a non-impact buffer zone will be established surrounding RMP CW008-020. This area will be suitably fenced for the duration of the decomissioning works, with the security fence standing on a rubber base, and all personnel will be notified of the restrictions pertaining to this area. In particular, no machinery, storage of materials, or any other activity related to decommissioning will be permitted within the defined zone. The monument will thus be fully protected during the decommissioning phase.

As part of the Permitted Development, a non-intrusive decommissioning method will be used for areas of ballast design. No earthworks of any kind will be carried out within the zones with ballast PV panels to ensure no subsurface impacts on any of the potential archaeological features. These zones will also be fenced off for the duration of the general decommissioning and only entered by contractors assigned. The security fence to be erected will stand on rubber bases; consequently, no subsurface intrusion will take place. The monuments will thus be fully protected during the decommissioning phase of the Permitted Development.

The 110kV substation has been designed to avoid impact on all known archaeological monuments and features.

It is not anticipated that the 110kV substation will be decommissioned within this timeframe and continued use of the 110kV substation will be confined to the compound area and access road only. Regardless, the 110kV substation has been designed to avoid impact on all known archaeological monuments and features and the monuments will thus be fully protected during the decommissioning phase if required.

The 110kV underground cabling along the grid route will be left in-situ and any monuments will thus be fully protected during the decommissioning phase if required.

2.11 Summary

Given the operational nature of the Proposed Development, the short timeframe of the decommissioning works and the small amount of infrastructure to be removed, it is considered highly unlikely that any of the decommissioning activities will pose environmental risks.

This decommissioning plan will be updated as required to ensure that the plan is in accordance with all best available technology and site restoration methods.