Proposed Solar PV Development

Byers Gill Solar
EN010139

6.4.2.3 Environmental Statement Appendix 2.3 Assessment of Likely Waste Arisings

Planning Act 2008

APFP Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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1. Introduction

1.1.1. This document provides an assessment of likely waste arisings from the construction, operation and decommissioning stages of Byers Gill Solar (the Proposed Development). An assessment of likely waste arisings was requested by the Planning Inspectorate (PINS) via the Environmental Impact Assessment (EIA) Scoping Opinion in Environmental Statement (ES) Appendix 4.2 (Document Reference 6.4.4.2)):

"*… the ES should still contain a description of the potential waste streams from all phases of the Proposed Development, including estimated volumes and an assessment of the likely significant effects. In addition, the ES should describe any measures implemented to minimise waste and state whether the waste hierarchy will be utilised.*"

1.1.2. This document fulfils the request by PINS and provides a description of likely waste arisings along with an indicative assessment of significance in relation to landfill capacity.

1.2. The Proposed Development

1.2.1. The Proposed Development consists of a solar farm capable of generating over 50MW Alternating Current (AC) of electricity with co-located Battery Energy Storage Systems (BESS), located between Darlington and Stockton-on-Tees in north-east England. The Proposed Development is approximately 490ha and comprises six solar photovoltaic (PV) panel areas (Panel Areas A-F). The solar PV panels would be mounted on a metal frame in groups, fixed in position. An on-site substation would be located within Panel Area C.

1.2.2. The Proposed Development includes approximately 32.5km of 33kilovolt (kV) underground cabling between the Panel Areas and the on-site substation, as well as approximately 10km of 132kV underground cable to connect the Proposed Development to the grid connection at the existing Norton substation (located to the north-west of Stockton-on-Tees) with both on-road and off-road options. A range of supporting infrastructure is required for the Proposed Development, comprising BESS; transformers and inverters for managing the electricity produced; storage containers to hold this equipment; and security measures such as fencing, CCTV and lighting. The Proposed Development includes environmental mitigation and enhancement measures to avoid or reduce adverse impacts on the surrounding environment and nearby communities.

1.2.3. The majority of the Proposed Development is located within the administrative boundary of Darlington Borough Council, with a section of the cable route situated within the administrative boundary of Stockton-on-Tees Borough Council. A very small section of the Order Limits is within the administrative boundary of Durham County Council.

1.3. Construction activities

1.3.1. It would take approximately 12-18 months to construct the Proposed Development all at once, or 18-24 months to undertake the construction of each Panel Area in phases following the granting of the DCO.

1.3.2. The final programme will be dependent on the detailed construction methodology and potential environmental constraints which may impact on the timing of construction activities.

1.3.3. One construction compound will be located within each Panel Area. The construction compounds will contain construction worker welfare facilities, a site office, limited parking, wheel wash area, plant and machinery storage, Heavy Goods Vehicle (HGV) / delivery turning area and waste storage areas.

1.3.4. Relevant construction activities will include:

- Preparatory works: including ground clearance, construction of access tracks, erection of fencing;
- Construction works: including installation of solar PV modules, BESS, inverters, transformers, switchgear, onsite substation, cabling; and
- Commissioning, site reinstatement and habitat creation.

1.3.5. Full details of the Proposed Development and construction activities are provided in ES Chapter 2 The Proposed Development (Document Reference 6.2.2).

1.4. Operational activities

1.4.1. The design life of the Proposed Development is expected to be at least 40 years.

1.4.2. During the operational phase of the Proposed Development, on-site activities would be limited and restricted to maintenance activities, replacement of any components that fail, monitoring activities and vegetation management (which could include continued grazing). The Panel Areas would be surrounded by a 2m high security fence (deer fence) and would be monitored with pole-mounted CCTV cameras situated at key locations along the perimeter of the site.

1.5. Decommissioning activities

1.5.1. Following operation, the Proposed Development would require decommissioning. The process of decommissioning would involve the removal of all solar infrastructure, including the solar PV modules and on-site supporting equipment. Waste materials are to be recycled or disposed of in accordance with good practice and processes at that time. Any requests or decisions to leave certain infrastructure, for example access tracks, would be discussed and agreed with landowners as part of the decommissioning process.

1.5.2. The Order Limits would be returned to its original use as far as possible and practical with areas of established mitigation left in situ where possible and in agreement with the landowner.

1.5.3. Decommissioning is expected to take between 6 to 12 months and would likely be undertaken in phases.

1.6. Legislative and policy framework

1.6.1. The relevant legislation, planning policy and guidelines which underpin the assessment methodology and inform the scope of the assessment are outlined in this section.

Legislation

1.6.2. The legislation of relevance includes:

- Directive 2008/98/EC the Waste Framework Directive (as transposed into UK law as of 2018; see The Waste and Environmental Permitting etc. (Legislative Functions and Amendments etc.) (EU Exit) Regulations 2020;
- The Waste (England and Wales) Regulations 2011;
- The Controlled Waste (England and Wales) Regulations 2012;
- The Hazardous Waste (England and Wales) Regulations 2005;
- Waste (Circular Economy) Regulations 2020;
- The Environmental Permitting (England and Wales) Regulations 2016;
- The Landfill Directive (1999/31/EC);
- The Landfill (England and Wales) Regulations 2002;
- Environment Act 1995;
- Environment Act 2021;
- Waste Minimisation Act 1998;
- Waste and Emissions Trading Act 2003;
- Clean Neighbourhoods and Environment Act 2005; and
- The Waste Electrical and Electronic Equipment Regulations 2013.

Policy

1.6.3. The following national and local policies of relevance have been considered:

National

1.6.4. Under Section 104 of the Planning Act 2008 (the Act), the Secretary of State (SoS) is directed to determine a DCO application with regard to the relevant National Policy

Statement (NPS), the local impact report, matters prescribed in relation to the Proposed Development, and any other matters regarded by the SoS as important and relevant. Following their designation on 17 January 2024, there are three NPSs which are considered to be 'relevant NPS' under Section 104 of the Act:

- Overarching NPS for energy (NPS EN-1)
- NPS for renewable energy infrastructure (NPS EN-3)
- NPS for electricity networks infrastructure (NPS EN-5)

1.6.5. It is considered that other national and local planning policy will be regarded by the SoS as 'important and relevant' to the Proposed Development. A detailed account of the planning policy framework relevant to the Proposed Development is provided in the Planning Statement (Document Reference 7.1). The Policy Compliance Document (Document Reference 7.1.1) evidences how the assessment of waste has been informed by and is in compliance with the NPSs and relevant national and local planning policies. It provides specific reference to relevant sections of the ES which address requirements set out in policy.

1.6.6. Other national policies of relevance include:

- Waste Management Plan for England 2021 [1];
- Our waste, our resources: A strategy for England 2018 [2];
- National Planning Policy for Waste 2014 [3];
- National Planning Policy for Hazardous Waste 2013 [4]; and
- Waste Planning Practice Guidance 2015 [5].

Guidance

1.6.7. The following guidance informs the assessment: IEMA Guide to Materials and Waste in Environmental Impact Assessment 2020 (the 'IEMA Guidance') [6].

1.7. Scoping and Consultation

1.7.1. This section describes the scope of this assessment of likely waste arisings, including how the assessment has responded to the Scoping Opinion. A description of the consultation and engagement undertaken with relevant technical stakeholders to develop and agree this scope is also provided.

Scoping

1.7.2. The EIA Scoping Report set out the proposed scope and assessment methodologies to be employed in the EIA and is provided in ES Appendix 4.1 EIA Scoping Report (Document Reference 6.4.4.1).

1.7.3. In response to the EIA Scoping Report, a Scoping Opinion was received from PINS on 6 December 2022 and is provided in ES Appendix 4.2 EIA Scoping Opinion (Document Reference 6.4.4.2)

1.7.4. ES Appendix 4.3 EIA Scoping Opinion Response Matrix (Document Reference 6.4.4.3) contains a table that outlines all matters identified by PINS in the EIA Scoping Opinion and how these have been addressed in the ES or other DCO application documentation.

Consultation

1.7.5. Engagement in relation to likely waste arisings has been undertaken with a number of stakeholders throughout the EIA process.

1.7.6. The Consultation Report (Document Reference 5.1) submitted alongside the DCO application contains a full account of the previous statutory consultation process and issues raised in feedback. Matters raised regarding the scope, methodology or mitigation considered as part of the assessment of likely waste arisings were then subject to further discussions directly with stakeholders.

1.8. Assessment Methodology

1.8.1. This assessment is for waste arisings only, following confirmation from the PINS Scoping Opinion (Document Reference 6.4.4.2) that an assessment of materials is not required.

1.8.2. The assessment of the effects of the waste generation associated with the Proposed Development has been undertaken in line with the IEMA Guidance [6].

1.8.3. In terms of waste, the assessment considers the potential effects of the Proposed Development on landfill capacity during construction, due to the generation and disposal of waste.

1.8.4. The following information has been considered (where available) during the assessment:

- the type and estimated volume of excavation waste to be generated during construction and from operation of the Proposed Development; and
- the type and volume of waste to be discarded to landfill.

1.8.5. For waste environmental impacts, the sensitive receptor is considered to be landfill capacity. Through the ongoing disposal of waste and occupation of the available landfill void space, there is a continued need to expand landfill capacity, leading to the depletion of natural resources such as soils and mineral resources. The loss of natural resources from the disposal of waste, results in permanent adverse environmental impacts and degradation of the natural environment.

1.8.6. In the UK, landfill sites are permitted based on the type of waste that they are able to accept:

- Inert waste
- Non-hazardous waste
- Hazardous waste

1.8.7. These categories of landfill are distinct, and capacity is not interchangeable between them. The potential effects are therefore considered independently for each category of landfill. Landfill sensitivity is defined by assessing how the future baseline of regional landfill void capacity is expected to change without any additional waste from the Proposed Development. The sensitivity of landfill void capacity was assessed by applying the following two-step process:

- Forecast the landfill void capacity that is expected to be available within the defined expansive study areas in the absence of the Proposed Development for the study period. This was done using historical trends.
- The utilisation of void landfill capacity is then calculated, which compares capacity in the final year of construction to the baseline year.

1.8.8. Landfill sensitivity is defined by assessing how the future baseline of regional landfill void capacity is expected to change without any additional waste from the Proposed Development. Table 1-1 sets out the thresholds for assessing sensitivity in inert, non-hazardous and hazardous landfill.

Table 1-1 Sensitivity thresholds for inert, non-hazardous and hazardous landfill

Waste Types	Negligible	Low	Medium	High	Very High
Inert and non-hazardous	Remain unchanged or is expected to increase through a committed change in capacity.	Reduce minimally: by <1% as a result of wastes forecast.	Reduce noticeably: by 1-5% as a result of wastes forecast	Reduce considerably: by 6-10% as a result of wastes forecast.	Reduce very considerably (by >10%); reach capacity during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.
Hazardous	Remain unchanged or is expected to increase through a committed change in capacity.	Reduce minimally: by <0.1% as a result of wastes forecast.	Reduce noticeably: by 0.1-0.5% as a result of wastes forecast.	Reduce considerably: by 0.5-1% as a result of wastes forecast.	Reduce very considerably (by >1%); reach capacity during construction or operation; is already known to be unavailable; or, would require new capacity or infrastructure to be put in place to meet forecast demand.

1.8.9. Using baseline and waste forecast data, the potential magnitude of impact from waste is assessed by determining the percentage of the remaining landfill void capacity that will be depleted by waste produced by the Proposed Development, see Table 1-2.

Table 1-2 Magnitude of impacts threshold (adapted from IEMA Guidance [6])

Waste Types	No change	Negligible	Minor	Moderate	Major
Inert and non-hazardous	Zero waste generation and disposal from the development	Waste generated by the development will reduce regional landfill void capacity baseline by <1%	Waste generated by the development will reduce regional landfill void capacity baseline by 1-5%	Waste generated by the development will reduce regional landfill void capacity baseline by 6-10%	Waste generated by the development will reduce regional landfill void capacity baseline by >10%
Hazardous	Zero waste generation and disposal from the development	Waste generated by the development will reduce national landfill void capacity baseline by <0.1%	Waste generated by the development will reduce national landfill void capacity baseline by 0.1-0.5%	Waste generated by the development will reduce national landfill void capacity baseline by 0.5-1%	Waste generated by the development will reduce national landfill void capacity baseline by >1%

1.8.10. The significance of the effect is identified through comparison of the sensitivity of the landfill resource in the study area (see Section 1.9) and the magnitude of the estimated waste arisings. Effects of moderate, large or very large significance, are considered to be significant in EIA terms (see Table 1-3).

Table 1-3 Significance of effect matrix

	Magnitude of impact					
Sensitivity of resource/receptor		**No change**	**Negligible**	**Minor**	**Moderate**	**Major**
	Very High	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Sight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

1.9. Study Area

1.9.1. The study area has been defined in line with the IEMA Guidance [6] as follows:

- primary study area is based on the Order Limits; constituting the area within which waste would be generated; and
- the 'expansive study area' comprises a defined region, or multiple regions, whose landfill capacity can be reasonably expected to be affected by waste generated by the proposed development. In this case this region has been defined individually for inert, non-hazardous, and hazardous landfill using available Environment Agency data, Section- Landfill capacity for more details.

1.9.2. The expansive study area has been determined by analysing the latest Environment Agency data [7]. The destination of waste generated within County Durham has been analysed, with regions accepting more than 10% of total waste generated being selected to form the expansive study area.

1.9.3. The following sources of baseline date have been used:

- landfill capacity in North East and North West England (non-hazardous, inert and hazardous landfill void capacity); and
- allocated/safeguarded waste sites in the vicinity of the Proposed Development,

1.10. Baseline Conditions

1.10.1. The baseline conditions for the Proposed Development are presented below.

Waste

1.10.2. The waste generation of the current Order Limits is associated with agricultural practices. During construction, agricultural uses will cease within the Order Limits. Subject to further investigations and discussions, agricultural uses may resume within the Panel Areas once construction is complete, other than in the areas proposed for the on-site substation, operational access tracks and other infrastructure such as BESS, inverters, switchgear, and spare containers. No data is available for the current waste generation on site, therefore, a worst-case scenario will be taken. It is assumed that waste generation on site is currently zero tonnes per annum.

1.10.3. There is one record of active or recent landfill sites within 250m of the Site Area according to the Environment Agency (EA). The record pertains to Aycliffe Quarry Landfill located approximately 100m northwest of the northern Cable Route Area in Panel A (429262 E, 522104 N). The quarry permit is classified as effective status, allow ">10 t/d with capacity >25,000t excluding inert waste". The permit (ID. DP3039AU) is held by Stonegrave Aggregates Limited.

1.10.4. There are 2no. records of historic landfill sites within 250m of the Site Area according to the EA. The historic landfill records are as follows:

- Cobby Castle Lane. Located approximately 30m south of Panel F, Bishopton, Darlington, County Durham. Site ref. DL011. No information pertaining to license; and
- Stillington Refuse Tip. Located approximately 35m north of Panel F, Stillington, Durham, County Durham. There is also a BGS record pertaining to the Stillington Refuse Tip (ID. 1910).

1.10.5. There are no records of licensed waste sites or historical waste sites, according to the Environment Agency and local authority mapping respectively.

1.10.6. For further details, see ES Appendix 2.1 Phase 1 Geoenvironmental and Geotechnical Desk Study (Document Reference 6.4.2.1).

Waste Management

1.10.7. The Waste Data Interrogator data shows that inert and non-hazardous waste generated in County Durham is exported throughout the North East of England for management. The North East region, therefore serves as the baseline area with respect to inert and non-hazardous waste from the Proposed Development.

1.10.8. Due to the high cost of disposal and the relatively low availability of capacity, hazardous waste is typically transported greater distances for treatment and disposal. 2022 Waste Data Interrogator data [7] indicates that hazardous waste generated in County Durham is exported throughout North East and North West of England for management. There are no restrictions on the inter-regional movement of waste within the UK, and this export trend is driven through market forces such as the cost and availability of waste infrastructure. Therefore, these regions serve as the baseline area (North East and North West).

1.10.9. The Environment Agency's Waste Interrogator [7] and Remaining Landfill Capacity Report [8] provides baseline information regarding waste management data, including quantities and types of waste that operators of regulated waste management facilities deal with, and landfill capacity. The most recent available year for baseline data in the area is 2022 and is therefore used as the baseline year.

1.10.10. Landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste. The sensitivity of waste relates to availability of regional (and where appropriate, national) landfill void capacity in the absence of the development.

Landfill capacity

1.10.11. Based on data published by the Environment Agency, 2022 landfill capacity [8] for the baseline areas is as follows:

- Hazardous waste – 5,517,000 tonnes;
- Non-hazardous waste – 1,214,000 tonnes; and
- Inert waste – 10,617,675 tonnes

Landfill capacity future baseline

1.10.12. It is currently envisaged that construction of the Proposed Development would begin in 2024 and be completed by 2026. To ensure that the potential impact of waste generated by the Proposed Development is considered against the landfill capacity likely to be available in the years in which the waste is generated, forecasts have been made of the likely available landfill capacity between 2022 and 2026.

1.10.13. Trends in historic landfill capacity data (tonnes) for the last 10 years have been calculated. The trend for non-hazardous and hazardous landfill was extrapolated from 2021 for the baseline period (2022-2026). The calculated trend shows a steady decrease in inert, hazardous and non-hazardous landfill capacity in the future (Figure).

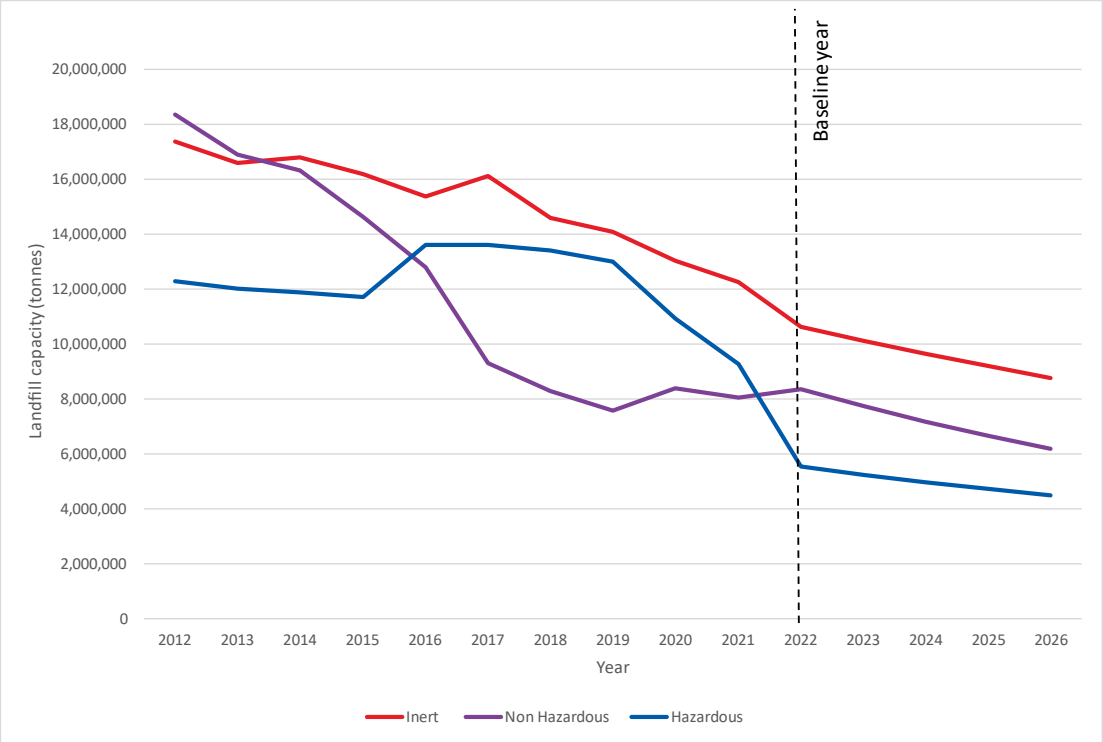

Figure 1-1 Landfill capacity future baseline

1.10.14. As defined in the IEMA Guide to Materials and Waste in Environmental Impact Assessment, the sensitivity of landfill capacity as a receptor is defined by the projected proportional decline in capacity within the assessment period, without the Proposed Development. It is forecast that by first full year of operation of the Proposed Development landfill capacity would have declined by the following rates:

- Inert waste – 17% utilisation of 2022 landfill capacity in the baseline region
- Non-hazardous waste – 26% utilisation of 2022 landfill capacity in the baseline region
- Hazardous waste – 18% utilisation of 2022 landfill capacity in the baseline region

1.10.15. Based on the above, the sensitivity of the identified receptors, as defined in Table 1-1, is considered to be:

- Inert waste landfill capacity – Very High
- Non-hazardous waste landfill capacity – Very High
- Hazardous waste landfill capacity – Very High

1.10.16. Whilst it is acknowledged that there is a general trend in reducing landfill capacity nationally, waste planning authorities have a responsibility under the National Planning Policy for Waste, to make provision for sufficient waste infrastructure capacity. Trends in waste generation, the way in which waste is managed, and the timeline of landfill waste diversion policies, show that there is likely to be a continued demand for landfill capacity beyond the study period. Overall, there is a general trend to send less waste landfill; although it is reasonable to assume that there will be remaining landfill capacity for the quantities of waste for which no suitable alternatives exist during decommissioning.

1.10.17. Based on current availability of specialist recycling infrastructure, it would be necessary for some materials to be disposed of to landfill during decommissioning. However, it is expected that in 40 years' time there will have been significant developments in waste treatment technologies required to recover the types of waste likely to be generated, and therefore minimal quantities will be sent to landfill.

Safeguarded waste sites

1.10.18. There are no allocated/safeguarded waste sites within the Order Limits. The assessment of safeguarded waste sites is therefore not taken any further.

1.11. Potential effects

Expected waste types

Construction

1.11.1. The Order Limits is primarily agricultural land (arable and grazing), therefore no demolition waste will be produced as part of the Proposed Development. It is also anticipated that minimal site preparation and excavation waste and from supporting footings would be generated given the baseline. The underground cabling runs through both agricultural land and roads, which are likely to generate minimal arisings from activities, and would be reused onsite as cable route cover.

1.11.2. All the electrical infrastructure such as solar PV modules, inverters, transformers, batteries and other supporting infrastructure will be manufactured offsite and delivered to the Order Limits ready for installation. Therefore, construction and assembly waste is expected to be minimal, including packaging wastes (wood and plastics), fencing (metal and wood), WEEE wastes and concrete.

1.11.3. No demolition is considered to be required for the Proposed Development.

Operation

1.11.4. Waste generation during the operational phase will include maintenance and replacement of proposed infrastructure including the solar PV modules, inverters, BESS and transformers. No replacement of cabling is anticipated during the proposed design life of the Proposed Development.

Decommissioning

1.11.5. The decommissioning of the Proposed Development would involve the removal of all solar infrastructure, including the solar PV modules, inverters, transformers, BESS and switchgear, and reinstatement of the Order Limits to its original use as far as possible and practicable.

Assumptions

1.11.6. Assumptions relating to the waste generation from the construction and operational phase, are set out in ES Chapter 5 Climate Change (Document Reference 6.2.5.1).

- Construction and Operational phase - waste generation:
  - 5% of the total concrete and aggregates used will be wasted; and
  - 2.5% of the total steel, aluminium and plastics will be wasted.
- Construction and Operational phase - waste disposal:
  - For concrete and aggregate, it has been assumed that 50% goes to landfill and 50% will be recycled;
  - For plastics the assumed ratio is 75%:25% recycling: landfill;
  - For steel it is assumed that all waste will be recycled; and
  - It is assumed that a licensed landfill site is within a 100km radius, and each HGV can carry a load 10 tonne per trip.
- Operational phase - maintenance and replacement of parts:
  - As the only operational energy requirements are security fence lighting, the carbon associated with this has been deemed to be negligible;
  - As there are no requirements for water use on-site, the carbon associated with this has been deemed to be negligible;
  - Solar PV modules – will be replaced depending on efficiency. It is expected to replace 10% of these over the lifetime of the Proposed Development;
  - All the supporting equipment is assumed to require replacement once, with a further 50% requiring replacement twice, during the design life; and
  - All BESS cells are assumed to require replacement once, with a further 50% requiring replacement twice, during the design life.

Anticipated disposal / recycling

1.11.7. In the UK, solar PV modules are subject to the WEEE Regulations 2013, as amended by the Waste (Miscellaneous Amendments) (EU Exit) (No. 2) Regulations 2019. The WEEE Regulations mandate that manufacturers must take back decommissioned solar PV modules for recycling. The aim is to ensure that the solar PV modules are disposed of responsibly and as much of the materials as possible are recycled. The Applicant will ensure that suppliers of solar PV modules for the Proposed Development are registered with a producer compliance scheme that has an industry managed take-back and recycling scheme.

1.11.8. Solar PV modules are made of a frame (typically aluminium), glass, crystalline silicon solar cells and copper wiring, of which between 90 - 99% can be recycled [9] [10].

1.11.9. Possibilities to re-use or recycle materials will be explored before resorting to landfill options in line with the Tees Valley Joint Waste Management Strategy 2020 to 2035 which seeks to improve reuse and recycling rates, in alignment with the Waste Management Plan for England 2021 [11] [1]. There is a new industry emerging for recycling solar PV modules. This would be explored, in addition to any resale of any operational panels.

Estimated likely waste arisings

1.11.10. The estimated types of waste, their likely source and management from the construction, operation and decommissioning of the Proposed Development is detailed in Table 1-5.

Table 1-4 Likely waste streams from the Proposed Development

Waste Streams	Construction	Operation	Decommissioning	Waste stream activity	European Waste Code	Waste type (Hazardous / Non-hazardous / inert waste)	Waste Management
Soils and stones	✓		✓	Site clearance and any excavations	17 05 04	Inert / Non-hazardous	Re-used onsite for cable cover.
Vegetation	✓		✓	Site clearance activities	20 02 01	Non-hazardous	Shredded and spread across the Order Limits.
Wood	✓		✓	Installation and removal of fencing and packaging	17 02 01	Non-hazardous	▪ Separated and either recycled or recovered for energy. ▪ Any ash produced from energy recovery will be sent to landfill.
Mixed metals	✓	✓	✓	▪ Installation and removal of fencing and packaging. ▪ Installation and removal of solar PV modules, cabling, inverters, transformers, BESS and switchgear. ▪ Maintenance and replacement of solar PV modules, inverters, transformers, BESS and switchgear.	17 04 01	Non-hazardous	Recycled with some disposal.
Plastic (packaging)	✓	✓		Packaging	17 02 03	Non-hazardous	▪ Recycled or recovered for energy. ▪ Any ash produced from energy recovery will be sent to landfill.
Plastic (solar PV modules)		✓	✓	Replacement and removal of solar PV modules.	17 02 03	Non-hazardous	Recycled with some disposal.
Glass		✓	✓	Replacement and removal of solar PV modules.	17 02 02	Non-hazardous	Recycled with some disposal.

Waste Streams	Construction	Operation	Decommissioning	Waste stream activity	European Waste Code	Waste type (Hazardous / Non-hazardous / inert waste)	Waste Management
WEEE	✓	✓	✓	▪ Installation and removal of solar PV modules, cabling, inverters, transformers, BESS and switchgear. ▪ Maintenance and replacement of solar PV modules, inverters, transformers, BESS and switchgear.	20 01 36	Non-hazardous	Recycled with some disposal.
Concrete	✓		✓	Installation and removal of foundations	17 01 01	Non-hazardous	Recycled for aggregate with some disposal

1.11.11. Therefore, the following waste streams requiring disposal to landfill include:

- wood ash from energy recovery;
- mixed metals;
- plastic ash from energy recovery;
- glass from solar PV modules;
- WEEE; and
- concrete.

1.11.12. Table 1-6 presents a forecast of the quantities of construction waste likely to require disposal to landfill, as provided by the Applicant. Waste quantity estimates during construction are presented in ES Appendix 5.1 GHG Assessment (Document Reference 6.4.5.1).

Table 1-5 Likely estimated construction waste disposal

Component or material	Disposal to landfill (Tonnes)
Concrete	146.79
Aggregate	372.9
Plastic	1.4

1.11.13. Waste arisings during operation are expected to be minimal, and would include:

- Welfare facility waste;
- Component replacement; and
- General waste (paper, cardboard, wood etc).

1.11.14. Component replacement estimates during operation are presented in ES Appendix 5.1 GHG Assessment (Document Reference 6.4.5.1), with all materials to be recycled with nothing going to landfill.

1.11.15. The process of decommissioning would involve the removal of all solar infrastructure, including the solar PV modules and on-site supporting equipment, from the site to be recycled or disposed of in accordance with good practice and processes at that time. Any requirements to leave certain infrastructure, for example access tracks, would be discussed and agreed with landowners as part of the decommissioning process.

1.12. Mitigation and Management

1.12.1. ES Appendix 2.6 Outline CEMP (Document Reference 6.4.2.6), ES Appendix 2.7 Outline Decommissioning EMP (Document Reference 6.4.2.7) and ES Appendix 2.11 Outline Site Waste Management Plan (SWMP) (Document Reference 6.4.2.11) provide

details around waste management, recycling opportunities, and off-site disposal during the construction, operation and decommissioning stages for the Proposed Development.

1.12.2. The SWMP would be progressed during the design phase and managed by the contractor during the construction phase to direct an effective circular economy approach to the management of resources and waste materials. This would drive the waste management activities up the Waste Hierarchy, to ensure that as much material as possible is reused and/or recycled to reduce the amount of construction waste requiring disposal. The Outline SWMP (Document Reference 6.4.2.11) will be finalised with specific measures to be implemented prior to the start of construction, in accordance with the DCO Requirements.

1.12.3. In order to control the waste generated on-site during site preparation and construction, the contractor will separate the main waste streams on-site, prior to transport to an approved, licensed third party waste facility for recycling or disposal.

1.12.4. All waste to be removed from the Order Limits will be undertaken by fully licensed waste carriers and taken to licensed waste facilities.

1.12.5. Reuse of excavated material within the site, will be undertaken in accordance with the CL:AIRE Definition of Waste: Development Industry Code of Practice [12].

1.12.6. Where practicable, the following approaches would be implemented to minimise the quantities of waste requiring disposal:

- Agreements with material suppliers to reduce the amount of packaging through a take-back scheme;
- Implementation of just-in-time material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- Attention to material quantity requirements to avoid over-ordering and generation of waste materials due to surplus;
- During site clearance and construction re-use of materials wherever feasible e.g. re-use of excavated soil for earthwork embankments and landscaping;
- The materials would be sorted or processed and where necessary, treated. Where materials excavated on-site are initially unable to meet the re-use criteria, they would either be treated to make them suitable for use or, as a last resort, disposed off-site as waste;
- Segregation of waste at source where practical;
- Re-use of materials within construction for example. Re-use of pavement planning in subbase in footpaths; and
- Re-use and recycling off-site where re-use on-site is not practical.

1.13. Assessment of likely waste arisings

1.13.1. The disposal of aggregates will impact inert landfill capacity void space. The Proposed Development will utilise approximately 0.004% of available inert landfill capacity in 2026. Following IEMA guidance this equates to a Negligible magnitude. Therefore, resulting in a slight, non-significant impact on inert landfill capacity from construction of the Proposed Development.

1.13.2. The disposal of concrete and plastics will impact non-hazardous landfill capacity void space. The Proposed Development will utilise approximately 0.002% of available inert landfill capacity in 2026. Following IEMA guidance this equates to a Negligible magnitude. Therefore, resulting in a slight, non-significant impact on non-hazardous landfill capacity from construction of the Proposed Development.

1.13.3. No hazardous waste generated during construction is forecast to require disposal to landfill and therefore the resulting impact of construction of the Proposed Development is a negligible, non-significant effect.

1.13.4. Waste arisings during operation are expected to be minimal, and would include:

- Welfare facility waste;
- Component replacement; and
- General waste (paper, cardboard, wood etc).

1.13.5. Component replacement estimates during operation are presented in ES Appendix 5.1 GHG Assessment (Document Reference 6.4.5.1), with all materials to be recycled with nothing going to landfill. Therefore, resulting in a negligible, non-significant impact on landfill capacity from operation of the Proposed Development.

1.13.6. The process of decommissioning would involve the removal of all solar infrastructure, including the solar PV modules within the Panel Areas and on-site supporting equipment, from the site to be recycled or disposed of in accordance with good practice and processes at that time. Any requirements to leave certain infrastructure, for example access tracks, would be discussed and agreed with landowners as part of the decommissioning process. The minimal quantities of waste required to be sent to landfill combined with the assumed landfill capacity during decommissioning, would result in a negligible, non-significant effect.

1.14. Summary

1.14.1. This report has provided a description of the potential waste streams from all phases of the Proposed Development, including an assessment of the quantity of waste that would need to be produced to generate a significant effect. It is not considered that the Proposed Development would generate enough waste to introduce a significant impact on landfill capacity.

1.14.2. In addition, the SWMP, CEMP and DEMP will include appropriate measures to minimise waste during the construction of the Proposed Development. Although minimal off-site disposal is likely to be required, it is not considered that an assessment of intra- or inter-project effects is required.

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