

Parc Solar Caenewydd, Swansea

Outline Construction Environmental Management Plan

Development of National Significance in the Renewable Energy Sector Full Re-Consultation before Applying for Planning Permission



On behalf of Taiyo Power & Storage Limited

October 2023 | P21-2998



Contents.

1.		1
2.	PURPOSE OF DOCUMENT	2
3.	ROLES AND RESPONSIBILITIES	3
4.	DEVELOPMENT SITE	4
5.	DEVELOPMENT DESCRIPTION	5
	Ground Mounted Solar PV Arrays	5
	Battery Energy Storage System	
	Ecological Enhancement and Biodiverse (SiNC) Habitat Management Areas	7
	Substation and Point of Connection to Overhead Pylon	8
	Operational Lifespan	8
	Decommissioning	9
	Undertakers	9
6		10
0.		10
7.	POLLUTION PREVENTION	11
	Pollution & Spillages	11
	Noise Pollution	12
8.	THE MANAGEMENT OF SEDIMENT AND SURFACE WATERS	
		1.4
	Foul Drainage	
	Site Establishment	14
9.	PUBLIC RIGHT OF WAY	16
10.	DUST AND EMISSION MITIGATION	17
11.	LOCAL COMMUNITY RESPONSIBILITY	
12.	CONTROL OF LIGHTING	
13.	MANAGEMENT AND MOVEMENT OF CONCRETE	
14.	ARBORICULTURAL MATTERS	23
15.	ECOLOGICAL MATTERS	24
16.	OPEN CUT TRENCHES	25
17.	NON-OPEN CUT (TRENCHLESS) CROSSING	
18	FISHERIES	28
19.	SOIL MANAGEMENT PLAN	



20.	WASTE MANAGEMENT PLAN	
	Implementation	
	Waste Management Hierarchy	
	Waste Arisings	
	Anticipated Quantities	32
21.	CRUSHING / SCREENING OF MATERIALS ON-SITE	33
22.	SUMMARY	34

Appendices contents.

Appendix	35
Appendix 1 – Site Location Plan	36



1. INTRODUCTION

- 1.1. Pegasus Group has been appointed by Taiyo Power & Storage Limited (herein referred to as "the Applicant") to coordinate an Outline Construction Environmental Management Plan for a proposed Non-ElA¹ utility-scale solar and battery storage facility (herein referred to as "the proposed development") on land fronting the A484 and Swansea Road (B4560) at Gowerton, Swansea (herein referred to as "the application site"). The proposed development will deliver a host of landscape, biodiversity, soil and hydrological enhancements. Including measures to strengthen habitat connectivity through this part of the valley, the creation of green buffer zones and public right of ways improvements. The proposed development is called 'Parc Solar Caenewydd'.
- 1.2. This draft Outline Construction Environmental Management Plan ("Outline CEMP") is being published to accompany a full pre-application re-consultation carried out under Articles 8 and 9 of the Development of National Significance (Procedure) (Wales) Order 2016. The Outline CEMP has been prepared with input from the Applicant, Devon Wildlife Consultants and Pegasus Group.

¹ On 17 August 2022, Planning & Environmental Decision Wales adopted its Environmental Impact Assessment (EIA) Screening Direction. The Welsh Ministers direct that the development is not EIA development within the meaning of the Regulations.



2. PURPOSE OF DOCUMENT

- 2.1. This Outline CEMP has been produced to set out the commitments of the Applicant towards securing specific mitigation measures and best working practices to adequately protect environmental resources during the construction phase of the proposed development, including potential impacts on human receptors. The Outline CEMP also sets out details on the construction working approach, including details on proposed working hours, construction compounds, control of lighting, management of vehicle movements, wheel washing facilities and waste removal.
- 2.2. The Outline CEMP outlines the measures which will be implemented by the Applicant during the construction phase of the proposed development once the permission is granted by the Welsh Minsters. The intention is for it to be converted into a Final CEMP following discussion with and approval by the Local Planning Authority (LPA) and Natural Resource Wales. This process will be secured by an appropriately worded planning condition attached to the permission.
- 2.3. The Final CEMP will be in accordance with this Outline CEMP and must be adhered to throughout the construction works by the contractor appointed by the Applicant to undertake the proposed development (referred to in this document as "the Contractor").
- 2.4. The Outline CEMP includes measures for the protection of habitats and species during the construction phase. This includes pollution control and runoff measures to protect a number of designated sites which are located within the Zone of Influence of the proposed development.



3. ROLES AND RESPONSIBILITIES

3.1. The following table will be completed for the Final CEMP and prior to the commencement of any works on site.

Role	Responsibilities	Contact Details
Construction Manager/Site Supervisor	Overall responsibility for the organisation and implementation of this CEMP. Ensure the site induction includes an introduction to the CEMP.	ТВС
Site Environmental Manager	Monitor site works and ensure no negative impacts on the environment occur. Conduct appropriate monitoring to ensure the CEMP is being adhered to. The Site Environmental Manager will also be responsible for conducting toolbox talks at the commencement of new activities, which will also draw from the CEMP and CEcMP.	TBC
Ecological Clerk of Works	Provide ecological advice and conduct monitoring during construction.	TBC
Emergency Contact	Natural Resources Wales - Pollution Hotline 0300 065 3000	
Wildlife Rescue Centre	Gower Bird Hospital, Sandy Lane, Southgate, Swansea SA3 2EW	



4. DEVELOPMENT SITE

- 4.1. The application site is located off of the A484 and B4620 Swansea Road. The National Grid Reference (NGR) for the centre of the application site is 260432, 196889, the closest postcode to the application site is SA4 4LE. The surrounding land use consists of a mix of residential, agricultural and industrial areas. The redline boundary for the application extends to a total area of 101.85 hectares. The siet location plan is provided at appendix 1.
- 4.2. The height of the land across the undulating application site ranges from c.55-9.5m Above Ordnance Datum (AOD) and is considered typical of the landscape of the surrounding valley landscape. To the south of the application site the land continues to rise, reaching c.170m AOD around West Cefncoed. The land gradually falls to the west to the Afon Llwchwr (River Loughor).
- 4.3. The application site sits at the southeast residential edge of Gorseinon, within the designated the green wedge and within a Special Landscape Area. The south of the residential site is offset from the edge of Gowerton and Waunarlwydd by woodland and vegetation along the railway line, Afon Llan and Westfield Industrial Park. The edge of Swansea is to the east, beyond intervening fields, woodland blocks, and vegetation along the Afon Llan. Substantial mitigation proposals would aim to retain and enhance the existing landscape elements which presently prevent coalescence.
- 4.4. The application site currently consists of a number of individual, agricultural fields. The site is bordered by Gors-Fawr Brook to the south, Gowerton Sewage Treatment Works to the west, agricultural land to the east, a business park, the B4560 and A484 roads to the north.



5. DEVELOPMENT DESCRIPTION

- 5.1. The application proposal relates to the construction, operation, maintenance and decommissioning of a ground mounted solar power and battery storage facility.
- 5.2. The proposed development can be split into four key components, these are:
 - Ground Mounted Solar Arrays
 - Compounds for the battery storage and substations
 - Cable Route and Point of Connection to the National Grid
 - Ecological Enhancement and Biodiverse (SiNC) Habitat Management Areas.

Ground Mounted Solar PV Arrays

- 5.3. The design principles of the solar modules are:
 - Arrays will be comprised of a galvanised steel and anodised aluminium mounting structure with the solar panels attached to it.
 - Arrays will have a maximum top height of 3m and the lowest part of the arrays will be 0.8m above ground level and this will vary across the development site.
 - All solar panels will be south facing.
 - Solar panels will be dark blue, grey or black in colour.
 - Indicative slope of the solar panels from horizontal would be 15 degrees.
 - Internal access track will be of permeable construction.
 - Typical minimum distance between edge of the arrays to the 2m high perimeter fencing would be 5m.
 - Biodiversity will be enhanced within and around the arrays.
 - Appropriate offset will be provided between the development and the Public Rights of way running through the site.
 - CCTV will be positioned along the perimeter fencing of the arrays, on 2.7m high poles.
- 5.4. The solar PV modules would convert solar irradiance into Direct Current (DC) electricity. The proposed PV panels may also be bifacial (such that they will collect light both on the front and the rear sides of the panel as it captures sunlight reflected from the grass surface under the solar framework).
- 5.5. The PV modules would be mounted on south facing galvanised steel and anodised aluminium metal racks. The racks will be laid out in multiple parallel rows running east to west across the various field enclosures. The framework and arrays would be static. The distance between



the arrays would respond to topography but would vary between 3.0m to 5.2m. Land between and beneath the panels would be used for biodiversity enhancements, as previously detailed above, and/or seasonal sheep grazing.

- 5.6. The arrays would be set within a 2.0m high security fence. Cables linking the rows of panels will be buried in the ground within trenches, typically 0.5–1.1m in depth. Further cables will be used to link areas of panels to inverters and then the substation compound located in the eastern parcel of the application site. The dimensions of the cable trenches will vary and compromise:-
 - 132KV cable trench depth between 1m to 2m, and width of 0.85m
 - 33KV cable trench depth between 1m to 1.5m, and width of 0.85m
 - 690v Trench depth between 0.9m to 1.2m, and width of 0.85m
- **5.7.** Sections of the cable will also be laid via trenchless techniques, such as under Afon Llan. A full assessment of the trenchless techniques would be provided for the final DNS application submission.
- 5.8. An internal access tracks is required, which involves the laying of permeable aggregate.

Battery Energy Storage System

- 5.9. The battery energy storage system consists of containerised battery units that can store energy and are able to release or absorb energy from the power network. Being able to absorb and release energy, the battery energy storage system at the proposed development can be used to contribute towards the frequency balancing services, where the power is being generated or absorbed statically or dynamically depending on the system frequency. When there is not enough power, batteries are discharged to balance under frequency preventing black and brown outs. To balance over frequency batteries are charged to prevent dangerous spikes across electricity infrastructure.
- 5.10. Under normal conditions the battery energy storage system would be unmanned. Visual checks will be undertaken during maintenance visits to the proposed development.
- 5.11. The equipment and infrastructure to be installed at the battery energy storage system include:
 - Internal access tracks
 - Vehicular parking
 - 52 No. containerised battery units measuring 7.81m by 2.65m with a heigh of 3.05m.
 - 8 No. skid mounted transformers and inverters
 - The surface of the battery compound will be surfaced with chippings.



Ecological Enhancement and Biodiverse (SiNC) Habitat Management Areas

- 5.12. Measures have been specifically designed to both enhance habitats after intensive grazing and arable chemicals and mitigate and compensate for the ecological impacts of the solar and battery elements of the development, in order to provide a gain in biodiversity at the site post-development.
- 5.13. Green infrastructure provision delivered as part of the proposed development will include:-
 - 4.75 acres of new tree planting
 - 3km of new hedgerows
 - Re-establishment of the 6.8ha Rhos grassland habitats
 - Enhanced 5.5ha of riparian habitats along the Afon Llan
 - Creation of 2.9ha of lowland meadow
 - 3.5ha of targeted habitats for reptiles, invertebrates and farmland birds.
- 5.14. Habitat conservation, creation and enhancement measures are proposed across the entire application site in order to increase the extent and quality of habitat along key corridors within and through the application site, notably complete exclusion from development of the most sensitive Rhos grassland SINC habitat field in the centre of the application site.
- 5.15. Various measures will strengthen habitat connectivity through the application site, including creation of buffer zones. This will include native wildflower seeding/green hay from a donor site (likely to be from retained habitat to the south) and alteration of grassland management to extend and enhance priority habitat. Planting of native hedge and scrub species, and creation of wild bird cover plots will aim to extend the habitat mosaic and enhance habitat value for a range of species including bats and farmland bird species. The river corridor and adjacent SINC are considered to be a key component of the mitigation approach; a continuous wide corridor of habitat creation and enhancement will be created along the river corridor, extending and linking valuable habitats as an ecological network.
- 5.16. Open riparian habitats will be retained as part of the mosaic, but with a wider buffer zone than at present. Treatment and removal of extensive Japanese Knotweed will also provide habitat enhancement.
- 5.17. Recreational benefits would also be incorporated in the ecological design strategy and these may include a permissible informal recreation area fronting Afon Llan and maybe a permissive walkway to increase connectivity from the farm shop to the wider networks of public footpaths within the locality. The ecological design strategy will be further developed in consultation with Swansea Council and National Resource Wales during the informal and formal pre-application.
- 5.18. A minimum of 20 bat boxes and 20 bird boxes will be installed on retained mature trees across the application site to provide new roosting and nesting opportunities for these species. Bird boxes will be suitable for a range of woodland bird species.



- 5.19. Any brash, log or grass arisings resulting from vegetation management will be utilised to create habitat piles, providing potential habitat and over-wintering sites for invertebrates, amphibians, reptiles and small mammals. At least 10 habitat piles of approximately 1m³ in size will be located within relatively undisturbed locations at the edge of the grassland on the application site, including within the reptile mitigation area.
- 5.20. Based on improvement of the habitat distinctiveness of improved grassland habitats, conversion of arable habitats to grassland, and enhancement of grassland in ecological buffer areas, the development proposals are currently likely to result in a net gain in biodiversity on the site.

Substation and Point of Connection to Overhead Pylon

- 5.21. A new substation compound will be required for the proposed development, and this will be constructed in the easternmost field of the application site. This is necessary to step up and covert voltage of the electricity delivered by the solar PV for connection to the National Gird Circuit.
- 5.22. There are two options put forward for the point of connection to the circuit, the first is the overhead pylon located off Ystrad Road, Forestfach. The proposed routing option runs along the existing local highways (namely Swansea Road, Carmarthen Road, Ystrad Road and Denver Road). The alternative point of connection is the terminal overhead pylon tower located to the north off Carmarthenshire Road, near the Paper Mill Fisheries.
- 5.23. The main design principles of the substation compound are: -
 - Security fencing 2.4m high palisade fencing
 - DNO compound comprising: emergency floodlight & CCTV columns; High level connectors; circuit breaker, low level disconnectors; and anchor blocks
 - Car parking.
- 5.24. The following elements will be located outside the compound: -
 - DNO Control Room & customer switchroom a small single-storey building housing the DNO main control systems and welfare unit with WC; and the customer switchgear for controlling the power flows from the solar park.
 - Cess pit
 - 15m or 25m high Communications Tower
 - 4.5m wide DNO track providing ingress / egress directly to/from Carmarthenshire Road.

Operational Lifespan

5.25. A temporary operational lifespan of 40 years would be sought for the entire development and linked to the first export date of electrical energy from the development. During the operational phase, the activities on the application site would amount to servicing and maintenance of plant and equipment and vegetation management. Traffic impacts from the



operational phase of the proposed development will only consist of between 10-15 Light Goods Vehicles per year.

Decommissioning

- 5.26. After a 40 year period the proposal would be decommissioned with all electricity generating equipment and built structures associated with the proposed development removed from the application site and the land returned to agricultural use.
- 5.27. A decommissioning plan would be prepared prior to the decommissioning commencing. The application site will be surveyed by an appropriately qualified ecologist to identify any ecological constraints arising from decommissioning activities. Depending on the ecological value of the habitats that develop over the lifespan of the scheme, it is possible that certain areas of the site may need to be retained due to their value for wildlife on decommissioning. Alternatively, and on application of the mitigation hierarchy principles, their loss may require compensation through on or off-site measures to ensure land/habitats are preserved for wildlife into the future.
- 5.28. It cannot reasonably be foreseen what legislative protection will be afforded to particular wildlife species at the end of the scheme's lifespan. Further surveys for protected species which could be impacted by decommissioning would also be expected.
- 5.29. Where possible and when electrical items have an ongoing life-span they will be removed from the application site in whole units and re-used in current form. Where units do not have an ongoing life-cycle they will be placed into a suitable re-cycling skip or container and then removed from the application site to a suitable waste recycling centre. Following decommissioning, there may be a period of soil management aftercare.

Undertakers

5.30. The layout of the proposed development will provide an appropriate easement for the existing underground infrastructure, which include sewers and gas pipes. No arrays will be erected over the line of any underground infrastructure.



6. CONSTRUCTION PRINCIPLES

6.1. The application site will be set up and managed with consideration to the principles laid out below:

- Considerate: All work is to be carried out with positive consideration to the needs of local businesses, neighbours, site personnel, visitors, and the public.
- Environment: Be aware of the environmental impact of the application site and minimise the effects of dust, noise, light and air pollution. Attention will be paid to waste management to reuse and recycle materials where possible.
- Cleanliness: The application site will be kept clean and in good order at all times. Application site facilities, offices, toilets and drying rooms will be maintained to a good standard. Surplus materials and rubbish will not be allowed to accumulate on the site or spill over into the surroundings and dirt and dust from construction operations kept to a minimum.
- Good Neighbour: General information regarding the works will be available to nearby neighbours. Full and regular communication with neighbours, including adjacent residents, farmsteads and businesses, regarding programming and site activities to be maintained from prestart to completion.
- Respectful: Respectable and safe standards of dress to be maintained at all times. Pride in the management and appearance of the application site and the surrounding environment shown at all times.
- Safe: Construction operations and site vehicle movements are to be carried out with care and consideration for the safety of site personnel, visitors, the public and the environment.
- Responsible: Ensure that everyone associated with the application site understands implements and complies with this code.
- 6.2. The health, safety and environmental expectations are as follows:
 - To have no accidents or dangerous occurrences on site
 - To have no occupational ill health arising from the project
 - To ensure no environmental damage occurs from the project
 - To ensure the least disruption to the local community from the project, and
 - To exclude as far as is reasonably practicable all unauthorised persons from the project

7. POLLUTION PREVENTION

Pollution & Spillages

- 7.1. To avoid pollution incidents which may impact the watercourses within or adjacent to the application site, and designated sites located downstream, measures for the safe storage of chemicals and materials shall be implemented.
- 7.2. Any potential contaminants (fuel, oils and chemicals) used during construction will be stored in designated compounds on an impermeable surface, at least 15m from any watercourse. These will be securely locked away when not in use.
- 7.3. Where bunds or similar containment systems are used at fuel/chemical/COSHH storage and handling areas, they should be sized to hold 110% of the capacity for a single container/drum/tank, or where there is more than one container/drum/tank, not less than 110% of the largest container or 25% of their aggregate capacity, whichever is the greater. This is in line with CIRIA guidance.
- 7.4. Appropriate pollution control measures will be employed in accordance with those outlined in the NetRegs document Guidance for Pollution Prevention (GPP) 5: Works and maintenance in or near water (February 2018). Although not endorsed by Natural Resources Wales (as NRW do not currently provide good practice guidelines following the withdraw of Pollution Prevention Guidelines (PPG) 5), measures in this document (accessed at: http://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-nearwater.pdf) should nevertheless be followed in order to prevent pollution of the nearby watercourses and ensure any pollution events are dealt with swiftly.
- 7.5. A spill kit must be kept on site with sand, earth or commercial products for the containment of fuel and other material spillages. All staff will receive appropriate training in the use of these kits and are to be made aware of where the kit is stored.
- 7.6. A detailed pollution/spill response plan will be kept within the site office.
- 7.7. In the event of an accidental spillage, the following procedures will occur:
 - The source of the spill will be stopped and any surrounding site personnel informed
 - The Site Environmental Manager will be informed immediately
 - The spill will be contained through use of a spill kit or other available materials.
 - If the spill occurs close to a watercourse or other sensitive habitat, measures will be taken to ensure that the spill does not affect this area (this may include covering with ground mats, creation of a bund or channel)
 - If required, the Site Environmental Manager will contact NRW to inform them of the situation.
- 7.8. Machinery, plant and vehicles have the potential to cause pollution via hydrocarbon contamination. All vehicles and plant used for construction must be maintained to good working order to ensure that there is minimal risk for potential fuel or oil leaks within the



application site. Refuelling of any plant and site-based vehicles will be carried out by a suitable qualified person to ensure that potential pollution incidents are prevented, and a quick response plan is implemented should a spill occur. Fuel delivery and refuelling will take place in the construction compound(s).

Noise Pollution

- 7.9. 'Best Practicable Means' should be employed across the construction phase to ensure impacts are minimised. These measures should include:
 - Equipment should be turned off when not in use and no vehicle idling should be permitted within the construction site including construction yards etc;
 - Where possible all noisy plant and equipment should be replaced with less noisy alternatives;
 - All plant should be properly maintained and all noise control measures be properly employed i.e. exhaust silencers fitted, vehicle panels closed etc;
 - All panel frame supports are to be push driven. Pre-auguring can be used to facilitate this. Where ground conditions do not allow this, alternative methods should be selected with a view on their potential noise emissions. Impact driven supports should be viewed as a last resort;
 - Do not drop materials i.e. access road surface materials etc, from excessive heights. Where necessary consider screens around material drop areas;
 - Where no other practicable means are available, the use of appropriately designed, temporary acoustic screens can be considered for noisy works close to residential properties;
 - Construction traffic should be timed and routed to minimise the impact to local residents; and,
 - Noise monitoring should be carried out in the event of valid complaints.



8. THE MANAGEMENT OF SEDIMENT AND SURFACE WATERS

- 8.1. The CEMP must include measures which will reduce the risk of silt and waste entering the receiving watercourses during construction, which may affect the watercourses and designated sites located downstream.
- 8.2. Within the higher risk areas, mitigation will be installed adjacent to watercourses (between the construction area and the watercourse) prior to construction commencing as a precautionary approach. This may include a geofabric fence or straw/hay bales. The management of sediment and surface water run-off generated during the construction phase of the proposed development will be controlled through good practice construction techniques.
- 8.3. Major construction works (e.g., large-scale earthworks associated with the construction of the substation and battery compounds; directional drilling; creation of new access tracks) will be minimised during heavy precipitation events. The CEMP will be required to include precautions to be taken if the weather is wet during construction, the precautions and mitigation measures include: -
 - Planning the construction work to minimise repeated trips over the ground;
 - Forming the permeable tracks early in the process;
 - Using machines with low pressure tyres eg farm type machinery;
 - Monitoring the weather and being alert to the implications of wet weather;
 - Inspecting surfaces to identify areas at risk of causing silt pollution to watercourses;
 - Restricting operations in areas vulnerable to causing pollution, especially in wet weather;
 - Keeping a store of straw/hay bales and geofabric fence equipment to delay and filter runoff;
 - Being ready with trained staff to deploy the equipment if a risk of silt pollution arises;
 - Early preparation, seeding and protection to encourage vegetation to establish on all bare areas as soon as possible after construction.
- 8.4. An appropriate 8m buffer zone will be set between the proposed development and any watercourse / ditches.. No development will be proposed within these minimum buffer zone, with an exception for fence crossings, culverts and access tracks.
- 8.5. The first step towards preventing silt pollution from the proposed development shall be to minimise the generation of silt-laden runoff. This can be achieved by the Site Manager carefully planning the site works so that activities likely to generate silt-laden runoff are carried out during drier weather, and erosion of surface soils and excavations is controlled. The second step is to treat surface water containing silt prior to it entering watercourses.



Prior to commencement of construction, a double layer of high-performance silt fencing will be installed between sources of siltation and watercourses where vegetation clearance, temporary stockpiling of soil or other materials, or access/egress routes are required. Where silt fencing cannot be installed, straw bales or other measures will be adopted to prevent siltladen water from flowing overground or via the existing network into watercourses.

- 8.6. Environmental emergency response measures are required in the event that either of these two steps fail. The emergency response procedure is set out below:
 - Any environmental incidents will be reported directly to the Site Environmental Manager;
 - The emergency response will be led by the Site Environmental Manager;
 - Measures will be put in place immediately such as the installation of silt fencing or hay bales. Surface water may need to be redirected from watercourses through the use of swales or attenuation pools; and
 - NRW will be contacted if appropriate to report the incident.

Foul Drainage

8.7. During the construction phase, 'Porta-loo' type facilities, or equivalent, will be used and emptied by a waste contractor, therefore nullifying any potential effects on drainage ditches and watercourses.

Site Establishment

- 8.8. During the mobilisation period of development, a security cabin will be placed within the area designed for the temporary construction compound.
- 8.9. The construction compound will be positioned at an appropriate distance into the application site to prevent the likelihood of any construction traffic having to queue on the adjacent public highway during busy periods.
- 8.10. A project notice board would be installed at the main entrance to the application site and at the internal crossing points along the Public Rights of Way traversing the application site.
- 8.11. Site welfare facilities and offices will consist of linked "Portakabin" type units.
- 8.12. The welfare facilities will have hot and cold running water, with a clean drinking water supply. Washing facilities and showers will be provided for the duration of the works, to include soap and towels or other suitable means of drying.
- 8.13. All welfare facilities will always be kept clean, tidy, and hygienic.
- 8.14. First aid facilities will be provided together with a trained first aider during working hours.
- 8.15. The temporary construction compound will be equipped with Fire Points and a wireless evacuation alarm system. Designated Fire Marshall and Fire Coordinator would be appointed as part of a Construction Phase Health and Safety Plan.



- 8.16. Construction works will be carried out Monday to Friday 07:00–18:00 and between 08:00 and 13:30 on Saturday, unless otherwise agreed by the relevant planning authority. The following works may occur outside these hours:
 - emergency works; and
 - works which do not cause noise that is audible at the boundary of the Order limits.
- 8.17. Any emergency works must be notified to the relevant planning authority within 72 hours of their commencement.



9. PUBLIC RIGHT OF WAY

- 9.1. The existing PRoW routes are incorporated into the layout of the proposed development and will remain open during the construction period. For the locations that the PRoW would be affected by the construction works, namely, the internal access crossing points, signs for both PRoW users and construction vehicles will be erected to allow safe crossing of construction tracks for PRoW users. The final CEMP will include details with regards to the wording and location of the construction signage.
- 9.2. Where a PRoW crosses a temporary access track, it would be disproportionately disruptive to close the PRoW for the duration of the use of the temporary access track, particularly when the risk to the public is likely to be lower than crossing a public road due to the 10 mph speed limit of construction vehicles, as outlined in the Construction Environment Management Plan. A banksman will be provided at the crossing points and priority will be given to users of the PRoW.
- 9.3. Temporary fencing or the proposed stock fencing will be erected along either side of the PRoW at the start of the construction, and this will be retained for the period of construction.



10. DUST AND EMISSION MITIGATION

- 10.1. It is considered that employment of construction best practice should ensure that no problematic dust or PM10 concentrations occur during the construction process.
- 10.2. IAQM guidance outlines a number of site specific mitigation measures based on the assessed site risk. The measures are grouped into those which are 'highly recommended' (i.e. should be employed) and those which are 'desirable' (i.e. should be considered under best practice).
- 10.3. As the application site is classed as low risk the following mitigation measures are highly recommended:
- 10.4. With respect to communications:
 - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
 - Display the head or regional office contact information.
- 10.5. With respect to site management:
 - Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
 - Make the complaints log available to the local authority when asked.
 - Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
- 10.6. With respect to monitoring:
 - Carry out regular site inspections to monitor compliance with the CEMP, record inspection results, and make an inspection log available to the local authority when asked.
 - Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- 10.7. With respect to preparing and maintaining the application site:
 - Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
 - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- 10.8. With respect to operating vehicle/machinery and sustainable travel:
 - Ensure all vehicles switch off engines when stationary no idling vehicles.



- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- 10.9. With respect to operations:
 - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
 - Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
 - Use enclosed chutes and conveyors and covered skips.
 - Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- 10.10. With respect to waste management:
 - Avoid bonfires and burning of waste materials.
 - Additionally as the application site is classed as low risk the following mitigation measures are desirable:
- 10.11. With respect to preparing and maintaining the application site:
 - Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
 - Keep site fencing, barriers and scaffolding clean using wet methods.
 - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
 - Cover, seed or fence stockpiles to prevent wind whipping.
- 10.12. With respect to operating vehicle/machinery and sustainable travel:
 - Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
 - A speed limit of 10mph is set on where the surfaced areas cross a Public Right of way.
- 10.13. With respect to operations:
 - Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.



- As the application site is classed as low risk for earthworks no mitigation measures are required with respect to earthworks.
- 10.14. As the application site is classed as low risk for trackout the following mitigation measures are desirable:
 - All site access roads are to be assessed daily in terms of transient dust, with roads to be dampened down where required.
 - Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
 - Avoid dry sweeping of large areas.
 - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
 - Record all inspections of haul routes and any subsequent action in a site log book.
 - Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).



11. LOCAL COMMUNITY RESPONSIBILITY

- 11.1. The Site Manager will manage and co-ordinate on-site environmental activities and act as a point of contact for local residents. Liaison between the Construction Contractor and local residents will seek to ensure that any concerns are resolved quickly.
- 11.2. The Site Manager will be responsible for:
- 11.2.1. briefing the Construction Environmental Management Plan to construction staff;
- 11.2.2. fulfilling environmental obligations on site;
- 11.2.3. attending to any on-site environmental incidents or concerns;
- 11.2.4. reporting and monitoring any environmental incidents; and
- 11.2.5. ensuring waste management procedures are followed.



12. CONTROL OF LIGHTING

- 12.1. Depending on the time of year, some artificial lighting may be required to facilitate safe working environment during the working hours. Any artificial lighting would be limited to winter to reflect the shorter daylight hours.
- 12.2. A sensitive lighting strategy will be developed and any lighting will be deployed in accordance with the following recommendations:-
 - Use of lighting will be minimised to that required to achieve safe site operations;
 - Use of any portable lighting will utilise downward directional fittings to minimise outward light glare. Construction vehicles will use dipped headlights.
 - Key habitat corridors for bats, including hedgerows and woodland edge, will remain unlit. These restrictions are to be applied during the bat activity season which is from April to October (inclusive).



13. MANAGEMENT AND MOVEMENT OF CONCRETE

13.1. Ready-mix concrete will be used for the substation and transformer foundations and as such concrete will not be batched on site. If the truck cannot discharge directly into the works, then transport to move the concrete form the delivery truck to the works must be provided. On completion of discharge and before the truck returns to public highway the discharge chute will be cleaned. The Contractor will provide suitable facilities, such as lined skip, within the construction compound. The ready-mix concrete delivery lorries will then return to the batching plant for washout. Excess concrete will be sent back to the batching plant. To prevent pollution, it is important that all concrete pours are planned in advance and that specific procedures are adopted where there may be a risk of surface water or groundwater contamination.



14. ARBORICULTURAL MATTERS

14.1. The proposed site security fence (deer fence) that is to be erected within and around the periphery of the application site will act as an effective tree protection barrier if erected before any construction works commence within each part of the application site. This will mitigate the need to install large amounts of temporary protection fencing (to the standards set out in BS5837:2012) around the perimeter of the application site.



15. ECOLOGICAL MATTERS

- 15.1. A number of designated sites are located within the Zone of Influence of the project: Camarthen Bay and Estuaries SAC, Burry Inlet Ramsar Site and SSSI, Penyfodau Fawr To Llewitha SINC, Alcoa Wet Meadows SINC. During construction there is the potential for sediment runoff and pollution as a result of construction activity which could affect the designated sites within the Zone of Influence of the project. The pollution prevention and water management control measures outlined in Sections 5 and 6 above have been designed to avoid and minimise this risk.
- 15.2. An Invasive and Non-Native Species (INNS) Management Plan will be provided as part of the statutory consultation and application submission, including an updated survey for the extent of INNS across the site, and methods to avoid the spread of INNS during construction activities and vehicle movements during operation.
- 15.3. Badgers are present throughout the site. As a precautionary measure, a sloping plank or ramp will be left in any excavations deeper than 1m which are to remain open overnight, to avoid trapping any badgers that may access the excavation. Alternatively, excavations will be covered or fenced overnight.
- 15.4. A sensitive lighting strategy will be detailed, and key habitat corridors for bats, including hedgerows and woodland edge, will remain unlit.
- 15.5. The habitats within the survey area are considered likely to support a diverse assemblage of nesting bird species, The removal of any vegetation suitable for nesting birds should be undertaken outside of the main bird nesting season of March to August (inclusive). If such works cannot be undertaken outside of the nesting season, a nesting bird check should be undertaken by an ecologist immediately before the vegetation removal works. The construction schedule should allow for potential delays in this case as any active nests must remain undisturbed until all the young have fledged naturally, which may take several months.
- 15.6. Otter presence on site has been confirmed through the identification of spraint on features within the river. As a precautionary measure, a sloping plank or ramp will be left in any excavations deeper than 1m, which are to remain open overnight, to avoid trapping any otters that may potentially access the excavation. Construction works within 100m of the watercourse will not take place at night as this is likely to unduly disturb any foraging/dispersing otters.
- 15.7. In order to protect the low number of reptiles recorded on site during the surveys, prior to construction vegetation around the limited field margins will be carefully strimmed or cut to ground level to enable any reptiles present to relocate into an area of safety. These works will be undertaken during periods of warm, sunny weather from April to September (inclusive).



16. OPEN CUT TRENCHES

- 16.1. The preferred method of laying cables is by burying them in an open-cut trench. However, sections of the cable run will be laid using non-open cut techniques.
- 16.2. For open trenches, the trench will be progressively dug using excavators and the excavated soil will be placed adjacent to the trench. Excavated soil will generally be stored on the opposite side of the working area from topsoil and there shall be no mixing of topsoil and subsoil. Dependent on the structure of the subsoil it may be necessary to excavate some areas in distinct layers and backfill the material in the same structured layers once the pipe is installed.
- 16.3. Once the trench is in an acceptable depth and condition to receive the cables; lower and lay operations can commence. Occasionally it may be necessary to remove water from the trench and excavations and this is carried out using portable pumps. As a precautionary measure, a sloping plank or ramp will be left in any excavations deeper than 1m which are to remain open overnight, to avoid trapping any badgers that may access the excavation.
- 16.4. Backfilling commences progressively to keep up with lower and lay activities so that excavations are kept open no longer than necessary and that the length of open trench is minimised. Backfill will progress in layers with each layer compacted sufficiently to prevent subsidence in the future. Part way through the backfill process heavy duty warning tape may be laid as a protection measure against the possibility of damage to the cabling works from any future excavation activities.



17. NON-OPEN CUT (TRENCHLESS) CROSSING

- 17.1. Trenchless techniques may be used for the laying of the cables under more sensitive area within the site, such as where the cable run would cross under er other utilities. Trenchless drilling has the advantage of minimising impacts to surface areas and reducing the levels of reinstatement requirement. It is a well-established and appropriate technique for crossing difficult terrains and sensitive features.
- 17.2. There are several non-excavation drilling techniques. These include auger boring, microtunnelling and direct pipe. The methods to be used will be finalised during the detailed design stage and will be subject to the results of a geotechnical site investigation and detailed discussions. Construction is likely to be of longer duration than open cut methods due to the engineering activities required. Construction techniques would be carried out in accordance with Health and Safety Regulations.
- 17.3. For auger boring, the technique requires the excavation of pits on either side of the crossing to aid the installation of the pipeline. The depth of the pits depends on the nature of the crossing and the local ground conditions. De-watering and sheet piling etc may be utilised if required to ensure a safe crossing design. A launch pit is excavated on one side of the crossing, following this a smaller reception pit is excavated on the opposite side of the crossing to receive the bore. Additional land is required on both sides of the crossing to accommodate the excavated material from the pits and the pipe, and to allow for the construction plant associated with the crossing. For auger bore, a pipe string is welded above ground and an auger drill inserted into it. A 'cutting head' is fixed to the auger drill at the front of the pipe string and rails installed in the floor of the pit for the unit to run on.
- 17.4. Power is transmitted to the auger drill via a power unit that is temporarily fastened to the rear of the pipe string and attached on to the rails. This pipe string is lowered into the thrust pit and is supported by crane-type side booms. Surveyors then line and level the pipe string to ensure it is installed in the correct location and at the correct depth. A combination of the rotation of the auger drill within the pipe string and a hydraulic thrust located on the power unit installs the pipe string. The excavated material is drawn from the cutting head, down the auger drill flutes exiting from the rear of the pipe string adjacent to the power unit.
- 17.5. For microtunnelling, the method involves the use of steerable remote control pipe-jacking. As with auger drill, it requires temporary launch and reception pits, drilling fluid management and associated equipment. Pre-cast concrete jacking pipes are placed behind a microtunnelling machine with a cutting head lubricated with water or a mud mix. Small quantities of bentonite may also be used to reduce friction. The excavated material is removed with the drill fluid and is returned to the surface via a slurry pipe through the tunnel entrance where the fluid is filtered to remove the cuttings and returned to temporary mud storage tanks for re-use. A thrust wall is constructed at the launch pit from which to jack the pipe forward. As the tunnel progresses new segments of pipe are attached at the launch pit until the microtunnel reaches the reception pit, where the drill bit is detached from the tunnel and removed. The jacked pipe can be the final pipe itself or a sleeve through which a smaller pipe is then threaded. Commonly the microtunnel crossing technique is used to cross infrastructure such as railway lines, major rivers and major highways such as motorways. The microtunnel is a crossing technique that performs well in a variety of ground conditions and gives the best guarantee of little or no settlement. The technique is very accurate and by



increasing the depth of such high risk crossings the possibility of settlement is reduced even further.

17.6. The direct pipe technique can be utilised as an alternative to the Horizontal directional drilling or microtunnel. This method uses the product pipe directly (rather than a concrete carrier sleeve) which is welded to the end of the microtunnelling machine. It is pushed forward by rams which push the pipe and the microtunnelling machine forward together. The microtunnelling machine has interchangeable cutting bits so it can deal with a variety of ground conditions. This technique tends to be used on longer crossings where there may be a number of obstacles to navigate.



18. FISHERIES

18.1. For the protection of fish and fish habitat, the final CEMP should set out the following requirements:

- No in river works should be carried out between 15th October and 15th April in any year.
- Where appropriate, all machines and plant to use biodegradable hydraulic oil and engine oil.
- Ensure full pollution prevention measure are in place as detailed above.
- The contractor should notify the start date of works to NRW's Swansea Environment Team (the local team), prior to any bankside work:-<u>swanseaenvironmentteam@cyfoethnaturiolcymru.gov.uk</u>
- A bespoke Flood Risk Activity Permit will be obtained by the contractor for works located in, under, over or within 8 metres of the bank top of the River Llan.



19. SOIL MANAGEMENT PLAN

- 19.1. Key threats to the soil resource at construction sites are trafficking of vehicles/plant and incorrect handling, which can cause damage to soil structure through compaction and smearing. These effects compromise the ability of the soil to perform its functions, such as providing adequate amounts of water, air and nutrients to plant roots. The risk of compaction and smearing increases with soil wetness. To minimise the risk of damage to soil structure, the generic guidance for construction sites is as follows:
 - no trafficking of vehicles/plant over in situ or bunded soils to occur outside demarcated working areas;
 - no trafficking of vehicles/plant on reinstated soil (topsoil or subsoil);
 - Where practicable soil handling when soil moisture content is above the plastic limit (the moisture content at which soil begins to behave as a plastic material and the soil is deemed too wet to handle without causing damage to the soil structure), will be avoided. Where operational constraints require the disturbance of plastic soil material, suitable remediation should be specified for instance the wind rowing of loose tipped material;
 - soil handling should be by excavator and dump truck as per sheets 1 to 4 of the Defra Good Practice Guide for Handling Soils
 - avoid handling of soils to be carried out during periods of prolonged, heavy rainfall;
 - no mixing of topsoil with subsoil, or of soil with other materials;
 - soil only to be stored in designated soil storage areas to be agreed as part of the approved CEMP;
 - plant and machinery only work when ground or soil surface conditions enable their maximum operating efficiency (i.e. when machinery is not at risk of being bogged down or skidding causing compaction or smearing);
 - all plant and machinery must always be maintained in good working condition to ensure that the soil is stripped correctly, for example to ensure that the depth of the strip can be accurately controlled, and to minimise the risk of contamination through spillages.



20. WASTE MANAGEMENT PLAN

20.1. Key environmental consideration for construction sites include the reduction of waste and the re-use of recycling of waste materials. Waste such as packaging, plastic, pallets, metal, general waste, etc, will be segregated on site and removed from site by an appointed waste contractor(s) for either reuse, recycling or disposal. All equipment associated with the development would be manufactured off site and delivered to the development site in appropriate packaging.

Implementation

20.2. Prior to the commencement of the proposed development a member of the on-site construction management staff will be assigned the role of Construction Waste Manager. The Construction Waste Manager will be in charge of preparing and implementation of the objectives of the WMP, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy, waste segregation arrangements and waste collection arrangements are adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on scheme adheres to the WMP. The WSP will form part of the final Decommissioning Plan.

Waste Management Hierarchy

- 20.3. The waste management hierarchy sets out the most efficient way of managing waste in the following order:
 - Prevention and Minimisation -The primary aim of the WMP will be to prevent and thereby reduce the amount of waste generated at each stage of the project.
 - Reuse of Waste Reusing as much of the waste generated on site as possible will reduce the quantities of waste that will have to be transported off site to recovery facilities or landfill, for example reusing wooden pallets.
 - Recycling of Waste: There are a number of established markets available for the beneficial use of construction waste such as using waste aggregate as fill for new access roads.
- 20.4. At all times during the implementation of the WMP, disposal of waste to landfill will be considered only as a last resort.
- 20.5. The expected waste types arising during the construction phase are expected to be: -

Materials type	Example	Waste Classification Code
Cables	Electrical wiring offcuts	
	copper	17 04 01
	aluminium	17 04 02



Cardboard	Boxes and cartons	15 01 01
Composite packaging	For transportation to site.	15 01 05
Metals	Copper, aluminium, iron and steel (mixed metals)	17 04 07
Inert materials	Sand, stone, aggregates	17 01 07
Mixed municipal waste	Daily canteen waste from construction workers, miscellaneous	20 03 01
Plastic packaging	Packaging with delivery of equipment	15 01 02
Wooden packaging	Boxes and pallets	15 01 03
Soil & stone	Soils and subsoils	17 05 04
Staff welfare facilities	Foul water / waste	20 03 04
Street-cleaning residue	Cleaning of local roads	20 03 03

Waste Arisings

- 20.6. Construction waste will arise on the proposed development mainly from unavoidable construction waste including material surpluses and damaged materials and packaging waste.
- 20.7. Appropriate measures will be taken to ensure excess waste is not generated during construction, including:
 - Ordering of materials will be on an 'as needed' basis to prevent over supply to site. Coordination is required with suppliers enabling them to take/buy back surplus stock.
 - Purchase of materials pre-cut to length to avoid excess scrap waste generated on site.
 - Request that suppliers use least amount of packaging possible on materials delivered to the site.
 - Ensuring correct storage and handling of goods to avoid unnecessary damage that would result in their disposal
 - Ensuring correct sequencing of operations.
 - Use reclaimed materials in the construction works.



- Waste Storage, Containment and Segregation
- 20.8. The waste materials will be segregates into reuse, recyclable or general waste in clearly identified skips or stockpiles in designated areas within the temporary construction compound. Materials to be reused or recycled will be sorted on-site and stockpiled for collection. All waste will be stored in an appropriate container to prevent escape of material. The application site will be left in a clean and tidy condition at the end of each day. Areas around the canteen, offices and skip will be clean and tidy. Food waste will be collected regularly to avoid attracting vermin to the site.

Anticipated Quantities

20.9. The predicted quantities are set out below and are based on the construction waste management records of a 25MW solar scheme.

Categry	Туре	Waste arising recorded from a 25MW solar scheme.	Predicted estimates for a 35MW scheme
General Waste Exchange	12yard skip	12	17
General Waste Exchange	RoRo – 20 yard skip	23	33
Timber Exchange	RoRo 20 yard skip	33	47
Card / Paper exchange	RoRo – 20 yard skip	12	17
Metal waste exchange	RoRo – 20 yard	6	9
Recyclable plastics	12 yard skip	2	3
Total skips	-	88	126

20.10. If necessary, a Materials Management Plan will be prepared by the Contractor to ensure that any excavated soils will be reused or reclaimed wherever possible, to maximise the resource and minimise waste generation. Topsoil, subsoil and bedrock spoil should not be mixed or stored together. The design proposed may be able to reuse topsoil and other materials, or dispose of the anticipated small quantities off-site. Effects on soil resources will therefore be mitigated by employing high standards of soils handling and management to recycle all potential reusable material either within the site or elsewhere.



21. CRUSHING / SCREENING OF MATERIALS ON-SITE

21.1. Construction does not involve the use of a mobile unit for crushing / screening of material on site.



22. SUMMARY

22.1. The purpose of this Outline CEMP is to set out the appropriate pollution protection & construction commitments that will be adopted by the appointed contractor team. This document demonstrates the measures that could be used during the construction phase to adequately protect environmental resources, including potential impact upon human receptors, as well as provide appropriate detail on the construction working approach. Post-consent, this Outline CEMP will require updating in accordance with approved documentation by the appointed contractor prior to any construction commencing onsite. A Final CEMP will be submitted to the LPA for approval prior to commencement to specify the details of the persons / bodies responsible for the activities associated with the CEMP and emergency contact details.



Appendix



Appendix 1 – Site Location Plan







Town & Country Planning Act 1990 (as amended) Planning and Compulsory Purchase Act 2004

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