

Margam Connection Port Talbot Substation

Environmental Risk Assessment

Prepared by: Laing O'Rourke

Revision: C

Reference: MARPT-LOR-XX-XX-PL-R-090012

Environmental Risk Assessment

S5 – For review and acceptance

Security Classification: Public



Environmental Risk Assessment

Margam Connection - Margam Substation

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Job Title:	Project lead

Current Activities Applicable *(equivalent to the tab completion)*

Design	Live	Drainage	N/A yet	M&E	N/A yet	Vetter	N/A to project
Procurement	Live	Groundworks	N/A yet	Commissioning	N/A yet	Glazing	N/A to project
Site Establishment	N/A yet	Substructure	N/A yet	Fit Out	N/A yet		
Demolition	N/A yet	Superstructure	N/A yet	Hard Landscape	N/A yet		
Piling	N/A yet	Roofing	N/A yet	Soft Landscape	N/A yet		
Earthworks	N/A yet	Logistics	Live	Tunnelling	N/A to project		

The contract is a two-stage, collaborative process to develop the project, including design and planning for construction before the main construction phase. The development will establish a new 33kV connection to TATA Steel UK from a new 275/33kV substation at TATA Steel UK Ltd, along with an associated cable interconnector route linking both substations. The new substation, owned and operated by NGET, will be named Port Talbot 275kV. Additionally, the existing Margam 275kV substation will be extended and reconfigured with new GIS, while existing overhead line circuits and SGT HV connections will be modified and diverted to new bays within the GIS.

Rev	Date	Brief Summary of actions/updates
A	03.12.24	Initial register development, Design, Procurement, Site Establishment and Delivery Phase aspects
B	28.01.25	Ongoing updates across ERA
C	29.07.2025	Update to reflect Margam requirements
D		
E		
F		
G		
H		
I		
J		

Risk Rating (RR) = Likelihood (L) x Severity (S)

The higher the risk rating value, the increasing likelihood of the activity causing environmental harm, a legal breach and/or the increase in the severity of the harm.

Likelihood (L) of the activity causing environmental harm	
1	Rare
2	Unlikely
3	Possible
4	Likely
5	Certain

Severity (S)	
1	Insignificant/Positive - Impacts either have a positive effect on the environment or are too small to have any significant effect
2	Minor - Noticeable damage to the environment, but the effects are very short lasting. All damage is easily repairable
3	Moderate - Significant damage to the environment, but the effects are short lasting. All damage is repairable
4	Major - Severe environmental damage, but the effects are non-permanent
5	Severe - Damage to the environment is both severe and permanent/long term

Condition Definitions	Normal	Standard hours, expected seasonal weather
	Abnormal	unexpected out of hours; overrun of works; extreme weather conditions, contamination of delivered
	Emergency	spill, fire, flood

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Environmental Risk Assessment -			Design						
For Design - considerations will be addressed within Design Team Meeting minutes and mitigation will be evidenced in the design drawings and specifications									
Sub-Activity	Associated Hazards / Risks	Potential Impacts (effects)	Risk Rating	Control Measures / Mitigation / Good Practice Measures	Opportunities (additional measures)	Residual Risk Rating	Owner (s)	References /Permits	Location on site
Carbon Management	The use of standardised concrete within the delivery stages of development	High carbon footprint, potential for resource depletion, and limited flexibility in adapting to specific project needs.	20	Reviewing concrete specifications for the use of low-carbon concrete to ensure that these materials meet required performance standards while minimising environmental impact.	Utilise low carbon concrete (concrete zero standard) LMR 18	10	Technical to ensure compliance for each discipline		
	Fuel usage (Diesel)	Diesel in construction and transportation contributes to environmental impacts such as air pollution, greenhouse gas emissions, and soil contamination, all of which contribute to climate change and degrade local ecosystems.	16	Efficient fuel usage is essential for reducing operational costs and minimizing environmental impact in industrial and construction processes.	Utilise HVO fuels - significant reduction in greenhouse gas emissions, lower particulate matter emissions, and a smaller carbon footprint due to its renewable nature LMR 25	8			
	Use of virgin raw materials / material resourcing	Climate change, ethical and economic (international and local)	16	Where practicable, factor in high recycled content or the reuse of materials across markets, such as structural steels, to promote sustainability and reduce environmental impact.	Optioneering for engagement with the supply chain for reusable steel involves exploring and identifying viable sources, partnerships, and processes that prioritise the recovery and repurposing of steel, ultimately fostering a circular economy and reducing resource consumption.	6			
Resource Management	Generation of excess waste materials	Landfill, costs, segregation, hazardous waste, carbon output	16	Implementation of a site waste management plan to control and capture waste generation, identify appropriate waste removal processes, and eliminate excess waste production.	Utilisation of local supplies to reduce the carbon footprint, along with the implementation of waste recording practices for better waste management and tracking.	6			
	Excessive use of imported fill materials contributing to increased environmental impact and resource consumption.	Costs, climate change, resource depletion	20	Implementation of material reuse and recycling of site-won materials, along with efficient design optimisation to minimize the need for imports.	Local supply chain, use of recycled materials, implementation of MMP	6			
	Excessive material usage from construction activities leading to increased waste generation and resource inefficiency.	Waste Generation, Costs	16	Utilisation of accurate material estimation, considering just-in-time delivery, coupled with careful and efficient material handling, and the use of modular and prefabricated components.	Utilisation of LoR specialist supply Select & Explore Manufacturing	6			
Natural Environment	Loss of biodiversity and negative impacts on ecological systems due to construction activities and environmental degradation.	Damage to ecological receptors	25	Integrating sustainable site selection, habitat preservation, native landscaping, green infrastructure, and biodiversity monitoring into the construction design to minimise ecological impact and promote environmental resilience.		10			
	Potential for fugitive emissions from construction and operational activities, contributing to air pollution and environmental degradation.	Pollution, climate change, local receptor change, legal	16	Implementing dust control, low-emission equipment, sustainable materials, efficient site management, and renewable energy solutions to minimise fugitive emissions and reduce air pollution throughout construction and operations.	Implementation of CEMP and icoperation within design input, use of sustainable action tool for optimisation	6			
	Excess carbon generation due to inefficient processes, excessive energy consumption, and high-emission activities contributing to environmental impact and climate change.	Climate change	16	Designing energy-efficient buildings with low-carbon materials, renewable energy integration, optimised construction processes, and sustainable transport to minimise carbon generation and environmental impact.		4			
Wider Sustainability	Lack of supply chain awareness regarding carbon emissions, leading to missed opportunities for reducing environmental impact and	Cost implication; Climate Change;	12	Integrating early supply chain collaboration, carbon tracking tools, and sustainable design practices to reduce carbon emissions in construction	Opportunities lie in adopting innovative materials, energy-efficient systems, circular design, and collaborative supply chain practices to reduce carbon emissions in construction	4			
	Misunderstanding of the social value aspects of the project, resulting in missed opportunities to enhance community benefits and contribute to long-term social well-being.	Cost implication; Climate Change;	12	Integrating community engagement, clear social value goals, inclusive design, and local economic support to enhance long-term social well-being in construction projects as well as local community during period of construction, such as opportunities for works etc...		4			

Environmental Risk Assessment - Procurement
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For Procurement - considerations will be evidenced within tender documentation, SWMP process, start up meeting minutes and supply chain audit

Sub-Activity	Associated Hazards / Risks	Potential Impacts (effects)	Risk Rating	Control Measures / Mitigation / Good Practice Measures	Opportunities (additional measures)	Residual Risk Rating	Owner (s)	Reference s /Permits	Location on site
Supply Chain Distribution	Supply chain disruptions may lead to significant delays in project completion.	Delays, increased costs, supply chain relationship	10	Developing contingency plans, securing alternative suppliers, and optimising lead time management, Identified long lead items at early stage, early engagement with all supply	Implementation of Procurement Strategy	4			
	Financial instability of the supplier could result in delays or inability to fulfill contract obligations	Project delay, cost implications, supply shortages	10	Conducting thorough financial assessments, diversifying suppliers, and establishing performance bonds, Identification of key suppliers and packages, Robust onboarding process for new supply chain (A56)	Use of specialist in house CHT, Select Plant, Expanded, Explore Identification of key partners in the main contract	2			
Environmental	Sustainable procurement practices ensure the sourcing of goods and services that minimise environmental impact.	Resource depletion, raised carbon footprint, supply shortage	10	Prioritise sourcing low-carbon, recycled, and renewable materials to reduce environmental impact, sourcing locally to reduce transportation emissions	SB Targets, Balacne score cards, Procurement strategy, Scoping templates allow for corrisponig scopes (SV, Sus, Env, Carb), Off site manufacturing opportunities (DfMA)	4			
	Unforeseen environmental events, like floods or wildfires, could impact transportation and logistics for procured items.	Project delay, cost implications, supply shortages, contractual	16	Diversifying suppliers, and developing robust contingency plans, Robust reactive supply chain	Implementation of Environmental Management, Design Management, and Logistics Management at the site level can effectively mitigate the impact of unforeseen environmental events, ensuring continuity and resilience in procurement and project execution.	6			

[illegible]

Environmental Risk Assessment - TOP 5 LOCATION RISKS

	High Level Risk	More detail as req'd	Main Mitigation	Opportunity?	Persons Responsible
1	Ecology	The site for development is currently designated as a SINC due to its native woodland, lowland fen and purple moor-grass and rush pastures, hosting a diverse ecosystem that supports a range of protected species, including Badgers, Water Voles, Schedule 1 bird species, and various reptiles.	Development of method statements and the application for licenses, where applicable, will be required to conduct works under qualified ecological supervision to ensure compliance with environmental regulations and protection of local species.	There is potential for early engagement, particularly concerning the water vole, due to constraints in the ecological calendar that may affect the timing of translocation efforts.	Laing O'Rourke, supported by RSK.
2	Water Abstraction / Discharge	Groundwater levels are currently at ground level and will require abstraction to prevent direct interaction with onsite working activities. Additionally, surface water discharge will be necessary from open cuts and trenching works.	Regulatory discharge requirements and onsite mitigation measures will be implemented to prevent pollution of the receiving environment.	Early engagement with the regulator to understand constraints, and early discussions with Tata to explore the potential use of existing infrastructure.	Laing O'Rourke, supported by WJ and RSK
3	Peat Management	Peat has been identified throughout the project footprint	Geotechnical investigation will be conducted to assess the depth of the peat and understand potential impacts. A Peat Management Plan will also be developed to manage the associated risks.	GI findings will be used to determine appropriate construction methods, such as piling and the depths for Horizontal Directional Drilling (HDD), in order to minimise impact on peat deposits.	LOR/RSK - Development of a Peat Management Plan to address and mitigate risks associated with peat deposits.
4	Materials Management	Due to the site's geology and hydrology, water levels currently exist at ground level, with extensive peat deposits reaching up to 8 meters thick in certain areas. This may necessitate a significant amount of imported fill across the project or the use of alternative methods for stabilisation.	Exploration of sustainable methods, such as using local or recycled materials for fill, implementing soil stabilisation techniques like bioengineering, or exploring in-situ methods to manage water levels and minimise environmental impact.		LoR/BakerHicks/RSK
5	Archaeology	Archaeological areas of interest are located throughout the site	Written Scheme of Investigation followed by Archaeological watching brief along certain areas of the works such as excavations		LOR/RSK/Hedland

NB The ERA must include considerations to meet the requirements of our Energy Management System (50001 certified). Examples have been included within the template

Environmental Risk Assessment (ERA) Completion & Implementation Responsibilities

Senior Leadership is accountable for managing environmental risk at their location and that control measures from the Environmental Risk Register are incorporated as appropriate into all activity including design, site set up, construction related activities and all related process e.g. Method statements, task sheets

Environmental Sustainability Advisor or Coordinator has ownership of this document and is responsible for completion which must be done in collaboration with the relevant parties (Design, Procurement, Engineering etc.). The EC/Environmental Manager must also coordinate and or carry out **reviews/updates** of the ERA (again in collaboration with relevant parties).

Environmental Sustainability Advisor or Coordinator is also responsible for ensuring this document is communicated appropriately to the relevant people (especially those with specific responsibilities within them)

Named activity owners are responsible for feeding information from the ERA into relevant method statements and task sheets and for informing the Environment Co-ordinator of any changes.

Named activity owners are also responsible for actioning/policing the control measures identified within the **ERA**

Environmental Risk Assessment (ERA) Explanation

You **MUST** consult with your Environmental Sustainability Advisor/Manager before using this template to ensure you understand how best to use it and how to identify your location's environmental **and energy** aspects and impacts. This is a **BASE** template that you can develop to best suit your location as long as the risk profile and main headings remain the same. The template follows a typical construction programme and some BU specific activity and therefore the way it is structured will not suit most linear projects nor permanent facilities. However the content i.e. examples of mitigation contained across the different tabs can still be used to instigate conversations about your locations particular risks and opportunities and enable you to develop this ERA to best suit your scope of works.

Delete/Hide/Add new worksheets as required.

Everyone's perception of risk is different. Scoring is subjective and whilst it is still significant in considering what mitigation is required, but you should not over-concern yourself about it. The most important aspects of the ERA are the conversations you have to identify the risks and afterwards ensuring you have applied controls, mitigation or have improvement measures in place.

This overall document is called the **Environmental Risk Assessment (ERA)**. Each Activity Tab is an Environmental Risk Assessment for that activity.

Header & Revision Control Tab - this is where you will enter the high level details about your location and where the Environmental Coordinator will record when updates have been carried out

Current Activities Applicable - A project / location (as above) **can change any of these headings to suit and add any tabs that they need to add as long as the columns and risk assessment is carried out in the same way..** A linear project will operate differently from a typical construction site and a depot will be completely different again. There are drop downs against each for yes, No, N/A/ Completed - these should always be completed so that a quick overview of activity is visible.

Top Five Risks - ideally you should summarise your project / locations significant risks here. They will mostly come from the ERA review process (highest scoring issues) but there may be something that sits outside of ERA that from time to time you may need to bring in here. As this is a 3-6 month look ahead these priority risks will change over time. Excavations presents very different risk to commissioning for example.

Activity Tabs (e.g. Enabling & Office /Welfare, Demolition, Earthworks) **should be completed as appropriate and applicable - for projects this will mean gradual development alongside the programme of works - activity tabs should be completed AHEAD of activity commencing.** Logistics has been set up as a separate tab as it applies to all aspects of any build or location, but it in no way replaces the Projects Logistics Plan or Traffic Management Plan. Vetter has their own tab covering their most common activity, but this activity could simply be embedded within mains works activity.

Sub Activities are those associated with the main activity e.g. Groundworks Activity Tab will be split into: excavation of materials; plant refuelling etc. You can add further activities as appropriate - feed any additions back to the Environmental Sustainability Leaders for the businesses for inclusion into future templates

Associated Risks/Hazards - these have been pre-populated based on our industry profile for a building programme not linear type projects (currently). You do not have to use these, you can add what you need to (use spare rows provided or insert your own).

Risk Ratings must be assigned for each risk identified in the Hazard/Risk column using the metrix at the top of each page. Consider risk BEFORE you have applied any controls e.g. If you did nothing the likelihood of a spill (e.g. during refuelling) is quite high but the severity of it **could be** quite low (because it occurs on a hardstanding away from drains); $4 \times 2 = 8$ (amber).

Everyone's perception of risk is different - do not get hung up on this, the important aspect is that you have implemented measure to reduce this.

If an activity is n/a you can type that in and leave it OR hide the row altogether.

Opportunities column - this column is where you can add additional control measures (perhaps additional plant/material or new technologies). Some examples have been listed to provide ideas (you may have additional ideas). Those locations showing commitment to continual improvement will have identified these and be implementing them at their locations. ONLY add them if you are implementing them

Residual Risk Rating must be assigned taking into account that all of the control measures stated are being implemented AND any additional measures (Opportunities) that you have put in place. Example: your original risk rating for the example above was an 8, but now you have implemented the use of plant nappies, spill kit training, spill kits etc. - now your residual risk could be more like $4 \times 1 = 4$.

Everyone's perception of risk is different - do not overthink this. The main objective is to ensure mitigation and controls are in place to minimise the risk

Owner - This should be used to identify the most appropriate person(s) for monitoring this particular risk

References /Permits - this should be used to reference when there is a particular permission/planning condition or permit related to the sub-activity e.g. Discharge; haz waste; hoarding; section 106; section 60; flood consent. You can use this also to explain HOW legal compliance is 'measured'/'monitored'

Location on site - does not have to be used but can be useful as an extra piece of information to help with identifying location of the issue (especially useful for external parties / audit. If not used - hide the column. This is the only column that can be hidden.

EAP - Not every location will have EAPs. These are for use after a location has gone through their significant energy use exercise and have then identified a specific area (or more) that could provide energy reduction. This may be a micro-experiment using a particular product or a behavioural programme testing if energy reduction can be achieved, or change of logistical approach etc. etc. The important thing is that each EAP covers one 'objective' and that its success is monitored through for example KPI monitoring or regular meetings or at the very least 6 monthly energy review.

Environmental Risk Assessment				Site Set Up & Establishment					
Sub-Activity	Associated Hazards / Risks	Potential Impacts (effects)	Risk Rating	Control Measures /Mitigation - (Minimum Requirements) Method statement considerations	Opportunities (additional measures)	Residual Risk Rating	Owner (s)	References /Permits	Location on site
All	Emergency Conditions - all activities								
	Major spill/drop outside boundary	Ground or surface water pollution, Local traffic disruption; public nuisance; waste materials; delay to programme	25	Refer to Logistics Plan/Traffic Management Plan, Environmental Emergency Plan, Water Management Plan emergency contractor spill response	NA	1	Project Leader		
	Major Spill/escape of material inside boundary	Ground or surface water pollution, creation of waste materials; delay to programme	25	Refer to Environmental Emergency Plan and Water management plan, spill control and emergency contractor spill response	NA	1	Environmental Leader		
	Fire on site	Damage to materials leading to waste, contaminants on slabs and potentially in drainage systems, fire waters	25	Refer to Fire and Emergency Plan and/or Environmental Emergency Plan; place drainage covers or drainage bunds if safe to do so; notify relevant authorities	NA	1	Construction Manager		
	Flooding (from major weather event or river / canal / sea incident)	Potential ingress into surface water drains of pollutants, ground or surface water pollution, impact to species and habitats	25	Material storage and refuelling areas outside of flood zone and/or over 10m from top of bank of river, whichever is greater. Subscribe to weather alerts and flood risk alerts. Refer to Environmental Emergency Plan. Move plant and materials outside flood zone. Compliance with Bespoke Flood Risk Activity Permits.	NA	10			
Office & Welfare Ordering and Installation	Normal Conditions								
	Connection/commissioning of water mains for offices and welfare. Remote working location water delivery, storage, use and disposal of water (drinking, flushing, cleaning, foul)	Foul water for shall be tanked from site, there are no live services within the area, existing substation operates on septic tank.	16	Encourage sustainable water use throughout welfare and offices to minimise water demand.	Potential for connection with LA	4	All Staff		
		Where mains are not yet connected element of tanked potable water is utilised to site. Potential for private connection with National Grid supply		Temporary connection to a private water network (through National Grid)					
	Procurement, use and disposal of office consumables (paper, ink, other stationary and electrical equipment)	Disposal of hazardous waste from ink, batteries. Disposal of recyclable office waste. Disposal of non-recyclable office waste. Disposal of WEEE waste.	12	Procure and install efficient technology and ensure programmes such as releasing printing is switched on.	Early engagement with procurement	4			
				Disposal in line with site waste management plan and welsh legislation for office management 2024.					
				Encourage sustainable use of office consumables e.g. do not print when possible.					
	Transport								
	Installation, operation and maintenance of equipment (refrigeration, air conditioning and fire protection systems) containing fluorinated greenhouse gases (F Gases)	Lack of maintenance / servicing of refrigeration, air conditioning and fire protection systems resulting in the release of F Gases into the atmosphere	12	Design in natural ventilation where possible to minimise the use of mechanical ventilation.	NA	4			
	Abnormal Conditions								
	Connection/commissioning of water mains for offices and welfare. Remote working location water delivery, storage, use and disposal of water (drinking, flushing, cleaning, foul)	Contamination of water supply during construction / connection / delivery of water to office / welfare locations	16	Procure and install water efficient equipment such as taps (flow rate) and toilets (flush volume).	Potential for connection with LA	4	All Staff		
		Difficulty of supply of water due to delivery problems, or supplier water shortage		Permanent connection to a private water network (through National Grid)					
	Procurement, use and disposal of office consumables (paper, ink, other stationary and electrical equipment)	Significant disposal of office wastes, i.e. due to office demobilisation	12	Remove all single use products from offices and welfare such as single use cups and paper towels.	Early engagement with procurement	4			
	Fire affecting office or welfare unit	Minor fire causing limited damage to office and/or welfare structures. Associated waste and potential contamination of underlying ground/water	12	Maintenance / servicing of refrigeration, air conditioning and fire protection systems		4	Construction Manager		

Energy Action Plan					
EAP Details					
EAP No./Ref.		Location Name		Location Type (Drop-Down)	
EAP Objective					
EAP Overview					
EAP Start Date					
EAP Completion Date					
		Energy Reduction Target			
Current Annual Site Energy Consumption (kWh)					
Estimated Energy Saving (kWh)					
Target Annual Site Energy Consumption (kWh)		0			
Overall Energy Reduction (%)		0%			
		Cost Saving & Payback			
Estimated Total Cost of EAP (£)					
Estimated Annual Cost Saving (£)					
Estimated Return on Investment (Months)		0			
		Monitoring & Reporting			
Energy Performance Indicator (EnPI)		e.g. 23kWh/100k or 1kWh/manhour			
How/when will performance be reviewed?		e.g. quarterly in SHELТ or BPR			
Name & job title of staff responsible for reporting					
EAP Activity Schedule					
	Action Summary	Timescale (Months)	Personnel Responsible for Action	Est. Date of Completion	Related Documentation
Action 1					
Action 2					
Action 3					
Action 4					
Action 5					
Performance Monitoring held on the project KPI Monitoring sheet					