

Appendix 2.2: Environmental Topics which are Not Significant

Overview

- 5.1 Chapter 5 of the EIA Scoping Report (**Appendix 2.1**) reported the topics for which there would be no likely significant effects, and therefore they were scoped out of the ES. Given the changes to the EIA Study Area Boundary (the Site) that was used as part of the EIA Scoping Report (**Appendix 2.1**) and the nominal changes to the Proposed Scheme set out within the EIA Scoping Report (see **Chapter 4: Development Specification** for full details), the initial scoping process has been reviewed and validated by the project team in light of the changes (further details are set out in **Chapter 2: Approach to EIA**). This iterative scoping process has confirmed that the changes does not amend the technical topics that were scoped out of the EIA and ES as part of the EIA Scoping Report (**Appendix 2.1**).
- 5.2 Nonetheless, it has been necessary to ensure the evidence base provided in the EIA Scoping Report fully considered all aspects of the Proposed Scheme (i.e., accounted for the changes) for completeness. Therefore, this Appendix has been prepared in order to re-presents the evidence from Chapter 5 and, where relevant, updates / validates the text to account for the changes.
- 5.3 It is noted that the evidence base provided as part of Chapter 5 of the EIA Scoping Report (**Appendix 2.1**) included a series of figures and appendices, some of which do not fully reflect the current Proposed Scheme (i.e., does not account for the additional temporary construction areas). Therefore, for completeness, **Table 2.3.1** confirms the status of previous figures and appendices previously identified and how these have been either provided (as part of the application reports set out in **Chapter 1: Introduction**) or as updated appendices to the ES, or where unamended remain the same as submitted within the EIA Scoping Report (**Appendix 2.1**).

Table 2.3.1: Updates to Chapter 5 from the EIA Scoping Report Presented in this Appendix

Topic / Supporting Document	Updated in this Appendix?
Built Heritage and Archaeology	Yes – minor updates to account for the increased spatial extent of the Site. No changes to conclusions of the EIA Scoping Report.
Archaeology and Heritage Assessment (previously Appendix 5.1 of the EIA Scoping Report)	No – provided as a stand alone Application report.
Written Scheme of Investigation (previously Appendix 5.2 of the EIA Scoping Report)	No
Ground Conditions, Soils and Contamination	Yes – minor updates to account for the increased spatial extent of the Site. No changes to conclusions of the EIA Scoping Report.

Topic / Supporting Document	Updated in this Appendix?
Desk Study (previously Appendix 5.8 of the EIA Scoping Report)	No – provided as a stand alone Application report.
Ground Investigation Report (previously Appendix 5.9 of the EIA Scoping Report)	No – provided as a stand alone Application report.
Detailed UXO Risk Assessment (previously Appendix 5.10 of the EIA Scoping Report)	No – provided as a stand alone Application report.
Desk Study for TCA at Margham Wharf (was not previously presented in the EIA Scoping Report)	No – provided as a stand alone Application report.
Flood Risk and Hydrology	Yes - minor updates to account for the increased spatial extent of the Site. No changes to conclusions of the EIA Scoping Report.
NRW Rivers (previously Figure 5.1 in the EIA Scoping Report)	No
WFD Waterbodies (previously Figure 5.2 in the EIA Scoping Report)	No
Flood Map for Planning – Rivers (previously Figure 5.3 in the EIA Scoping Report)	No
Flood Map for Planning – Sea (previously Figure 5.4 in the EIA Scoping Report)	No
Flood Map for Planning – Surface Water (previously Figure 5.5 in the EIA Scoping Report)	No
Detailed Baseline Fluvial Modelling 0.1% AEP CC (previously Figure 5.6 in the EIA Scoping Report)	No
Detailed Baseline Tidal Modelling 0.1% AEP CC (previously Figure 5.7 in the EIA Scoping Report)	No
Post-Development Tidal Modelling 0.1% AEP CC Road (previously Figure 5.8 in the EIA Scoping Report)	No
Post-Development Fluvial Modelling 0.1% AEP CC Road (previously Figure 5.9 in the EIA Scoping Report)	No
Flood Consequences Assessment (previously Appendix 5.3 in the EIA Scoping Report)	No – provided as a stand alone Application report.
Flood Risk and Drainage Candidate Site Supporting Statement (previously Appendix 5.4 in the EIA Scoping Report)	No

Topic / Supporting Document	Updated in this Appendix?
Flood Risk and Drainage Briefing Note (previously Appendix 5.5 in the EIA Scoping Report)	No
Transport	No – updates not required as no change to the peak vehicle movements.
Traffic Accidents (previously Appendix 5.6 in the EIA Scoping Report)	No
Link Reference Points (previously Appendix 5.7 in the EIA Scoping Report)	No
Marine Navigation and Marine Recreational Resource	No – updated not required as the changes are not relevant to this topic.
Lighting	Yes – minor updates to account for the increased spatial extent of the Site. No changes to conclusions of the EIA Scoping Report.
Waste	Yes – minor updates to account for the increased spatial extent of the Site. No changes to conclusions of the EIA Scoping Report.

Site Terminology

- 5.4 As outlined in **Volume 1, Chapter 2, 3 and 4** of the ES, the Site is split into a number of parcels/zones (**Figure 4.2**). This Appendix refers to both the Site as a whole, and individual parcels/zones. The individual parcels are referred to as follows:
- Primary parcel of land for the location of the proposed production facility (approximately 9.1ha), comprising bare land adjacent to Crown Wharf (Port Talbot) (referred to as the '*Production Development Zone [PDZ]*'), as defined within **Figure 4.7**;
 - Three discrete parcels of land located within the wider Port Talbot Docks, (approximately 7.44ha) (referred to as '*Temporary Construction Areas [TCA] 1, East and West*') TCA West, as defined on **Figure 4.7**, is split into two sub-parcels;
 - Approximately 0.87km of Phoenix Way, running adjacent to the northern boundary of the PDZ; and
 - An extent of the marine environment of Port Talbot Docks, located to the north of the PDZ and Phoenix Way.
- 5.5 As part of the EIA Scoping Report (**Appendix 2.1**) it was stated that where primary and tertiary mitigation is referred to throughout the below evidence base, a referencing system had been used (e.g. **[P1]**, **[T1]**, etc) to link this to the summary of the mitigation in the Preliminary EMP, included as part of the EIA Scoping Report (**Appendix 2.1**). These references has been retained for ease of reading alongside the original EIA Scoping Report

(Appendix 2.1). The measures have all been captured within **Volume 3: Environmental Management Plan (EMP)**.

5.6 For clarity, the environmental topics for which no likely significant environmental effects have been identified, and therefore 'scoped out' of the ES as part of the EIA Scoping Report **(Appendix 2.1)** are:

- Built Heritage and Archaeology;
- Ground Conditions, Soil and Contamination;
- Flood Risk and Hydrology;
- Transport;
- Marine Navigation and Marine Recreational Resource;
- Lighting; and
- Waste.

5.7 Finally, it should be noted that where reference is made to a CEMP within the evidence base, this is in reference to a detailed CEMP being prepared by the appointed contractor and submitted to NPTCBC prior to commencement of on-site works.

Updated Technical Evidence

Built Heritage and Archaeology

Technical Baseline

- 5.8 The heritage and archaeology baseline position for the Site has been informed by the Archaeology and Heritage Assessment (AHA) produced by EDP in July 2023¹ (submitted as a stand alone Application report). This is focused on the Site and a 3km study area².
- 5.9 The AHA defines the methodology employed to undertake the initial identification and assessment of potential impacts (whether direct or indirect) upon those historic assets which could be affected by the Proposed Scheme.
- 5.10 The AHA has been undertaken in line with relevant guidance³ and information on historic assets which was obtained from Cadw (for national designations); Glamorgan-Gwent Archaeological Trust (GGAT) (for Historic Landscapes); and the Royal Commission on the Ancient and Historic Monuments of Wales (RCAHMW) (via the NMRW).
- 5.11 The Site does not contain any 'designated' historic assets, such as scheduled monuments or listed buildings. At the same time, it is not located within the boundary of a more extensive designated historic asset such as a conservation area or an Historic Park and Garden; neither does it include any part of a heritage designation such as this within its boundary.
- 5.12 A number of designated historic assets are located in the wider surroundings of the Site. These assets include the Former Harbour House (Grade II listed building) across the Port of Port Talbot c.250m to the north of the Site (c.300m from the PDZ) and the Grade II listed Harbour Watch-tower c.850m to the west of the Site (c.1.1km from the PDZ), but also small clusters of listed buildings east of the Site within the settlement of Taibach, approximately 250m from the Site (c.700m from the PDZ), and further north around the Port Talbot Parkway railway station, approximately 800m from the Site. The locations of these designated assets are shown on **Plan EDP 2** within the AHA.
- 5.13 The Site itself is not identified as containing any 'non-designated' historic assets of recognised significance, with the Glamorgan-Gwent Archaeological Trust (GGAT) Historic Environment Record (HER) not recording any known archaeological sites, features, deposits or standing structures within its boundaries.
- 5.14 However, a single 'non-designated' historic asset is recorded within the EIA Study Area, which extends c.200m beyond the dock walls of Crown Wharf. This record is located within the 'Marine Unloading/Loading Facility', immediately north of the PDZ. This record comprises a Jetty, located within the Old Dock at Port Talbot (GGAT08808w). The Jetty is depicted on the 2nd edition OS map of 1899, although remodelling of the Dock indicated on the 3rd edition OS map of 1919 shows that the jetty was replaced by a new linear structure, and no

¹ EDP, 2023. *Crown Wharf, Port Talbot: Archaeological and Heritage Assessment*.

² Informed by a Zone of Theoretical Visibility (ZTV) for the Proposed Scheme (**Plan EDP 8** within the AHA).

³ Cadw 2011 Conservation Principles, Policies and Guidance for the Sustainable management of the Historic Environment in Wales (Cardiff); Cadw 2017a Heritage Impact Assessment in Wales (Cardiff); Cadw 2017b Setting of Historic Assets in Wales (Cardiff); and Cadw 2017c Managing Conservation Areas in Wales (Cardiff).

visible elements of the jetty remain. However, there is some slight possibility that some elements of its basal structure may survive. Given the nature and condition of this feature, if indeed it does survive, it is unlikely to be of greater than very low, local interest.

- 5.15 There is relatively limited evidence for archaeological activity in the general surroundings of the Site and in the main this focuses on former dockside features to the north, former industrial features related to the Margam Iron and Steel Works and Margam Copper Works to the east and historic features such as rifle ranges to the south. These HER records are illustrated on **Plan EDP 3** within the AHA. A review of **Plan EDP 3** within the AHA alongside **Figure 4.1** indicates that there have been no archaeological investigations undertaken within the Site, as indicated by the HER event records.
- 5.16 There is considered to be no more than a 'low' potential for the Site to contain significant archaeological sites, features and/or remains. Any such features are likely to derive from post-medieval and later activity at the site and would be of no more than low or local significance. Any deposits of earlier than post-medieval date, which might hence be of more than low significance, are expected to be deeply buried beneath deposits of modern made ground and therefore only potentially encountered by the deepest elements of the proposed development, such as piles for the buildings' foundations.
- 5.17 More widely, the non-designated 'Margam Mountain Landscape of Special Historic Interest', as defined by GGAT, is located circa 700m to the east of the Site's eastern boundary at its nearest point (c.1.1km from the PDZ), and rises up the steep slopes to the east of the M4 motorway. This non-designated asset is illustrated on **Plan EDP 5** within the AHA.

Effects Unlikely to be Significant

- 5.18 Based on the technical baseline and understanding of the Proposed Scheme (**Volume 1, Chapter 4** of the ES), the following effects are considered unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES. A factual evidence base has been provided below to support this. Where mitigation has been used to inform this judgement, the identified mitigation has been captured within the EMP provided in **Volume 3**.
- 5.19 All effects upon designated heritage assets are covered in an expanded AHA, which brings together the baseline position outlined by the AHA, and addresses all of the Proposed Scheme's impacts on the historic environment in one comprehensive evidence based report.
- 5.20 This expanded AHA is submitted as a stand alone report (**Volume 1, Chapter 2** of the ES) with the Application in accordance with Section 6.1.9 of PPW "Any decisions made through the planning system must fully consider the impact on the historic environment" and the Welsh Government's advice in Section 1.5 – 1.6 of supplementary document TAN 24, regarding the production of Heritage Impact Assessments. The expanded AHA will also consider all impacts upon non-designated heritage assets to satisfy the requirements of National Policy outlined within PPW and the advice given in supplementary document TAN 24.

Direct impacts upon designated historic assets

- 5.21 The Site does not contain any 'designated' historic assets and therefore the Proposed Scheme would not have a direct impact on a designated historic asset. In fact, any impacts on designated assets would be limited to 'indirect' impacts and arise as a result of changes

within their setting causing a loss of, or damage to, their significance. Such impacts are discussed in full below (**Paragraph 5.22 – 5.29**).

- 5.22 Therefore, it is assessed as being highly unlikely that there will be any significant direct impacts on designated historic assets and so therefore they will not be considered further in the EIA or reported in the ES.

Indirect impacts upon designated historic assets through changes to setting

- 5.23 It is expected that any impacts on designated assets will be limited to ‘indirect’ impacts and would arise as a result of changes within their setting resulting from the construction and/or operation of built form within the PDZ causing a loss of (or damage to) their significance.
- 5.24 Any changes to the setting of these designated assets during the construction stage would be temporary and reversible on completion of the Proposed Scheme and are therefore considered unlikely to be significant.
- 5.25 In addition, it is anticipated that for the most part potential impacts during construction are likely to be forerunners of comparable impacts arising as a result of the Proposed Scheme’s completion and operation. As such, it is more appropriate to consider them over the longer term when these potential impacts are expected to reach their fullest expression, even if it is recognised that in many cases they will emerge over time.
- 5.26 The outcome of the AHA and associated site visits/walkovers is that it is highly unlikely that any of the designated historic assets located within the Site’s wider surroundings would experience a significant indirect effect as a result of the Proposed Scheme.
- 5.27 This assessment is reached on the basis that the historic assets are (i) generally distant from the Site, with the closest being c.300m from the PDZ and the majority being over 700m from the PDZ, (ii) typically screened to at least some extent by existing built form adjoining the Site or located in its immediate environs, as is evidenced by the results of the ZTV (**Plan EDP8** in the AHA), or where glimpsed views are available, are in the context of an already industrial built backdrop and (iii) do not possess relationships with the land within the Site that make any particular contribution to their significance, as assessed in full within the AHA.
- 5.28 So, whilst the completed Proposed Scheme would to some extent be visible from several of the listed buildings located in the wider surroundings, its approval and implementation is unlikely to represent a change to their setting which would cause a loss of, or damage to, the significance of these designated historic assets.
- 5.29 Taking into account the baseline position around the Site, which already includes substantial modern industrial buildings and associated tall structures such as chimney stacks, and the fact that the Proposed Scheme would assimilate into the general surrounding built environment (including in terms of height), it is considered to be highly unlikely that, any of the listed buildings in the Site’s wider surroundings would experience a loss of (heritage) significance as a result of their relationships with the site being diminished.
- 5.30 Therefore, effects to designated historic assets are considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Direct impacts upon non-designated historic assets

- 5.31 Consultation of the GGAT HER, the West Glamorgan Archives and online sources; checked and augmented through the completion of a visit and walkover of the Site and its

surroundings in the summer of 2022 and spring-summer 2023; has demonstrated that (i) the Site does not contain any known and recorded non-designated historic assets of potential significance and (ii) the Site is assessed to have a very low potential to contain hitherto unknown/unrecorded non-designated historic assets (such as archaeological remains) of any greater than low or limited significance. This assessment of the archaeological potential is detailed in full within the AHA.

- 5.32 Whilst it is likely that any non-designated historic assets within the Site, such as below ground archaeological features, deposits and remains; may well be totally destroyed by the construction of the Proposed Scheme through activities such as the insertion of foundations and the installation of services etc, namely within the PDZ, as well as ground works for the Port Road and 'Temporary Construction Areas', it is unlikely that this would generate an impact of sufficient severity to be considered significant.
- 5.33 Therefore, direct impacts upon non-designated historic assets are considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.
- 5.34 The predicted nature of the impact is sufficiently insignificant that it could be adequately dealt with through the implementation of a condition requiring a Written Scheme of Investigation, if considered warranted by NPTCBC, to allow adequate recording prior to or during construction [T10].

Indirect impacts upon non-designated historic assets through changes to setting

- 5.35 As above, indirect impacts as a result of changes to setting are focused upon the operation of built form within the PDZ, rather than the Site as a whole, because this is the element of the Site which is expected to experience a substantive change in its use and appearance through the long term addition of new built form.
- 5.36 Moreover, it is assessed that any potentially significant indirect effects through changes within the setting of non-designated historic assets are likely to occur following completion of the Proposed Scheme and during its subsequent operation.
- 5.37 Any changes to the setting of non-designated assets during the construction period would be temporary and reversible on completion of the development and are therefore considered unlikely to be significant.
- 5.38 In addition, it is anticipated that for the most part potential impacts during construction are likely to be forerunners of comparable impacts arising as a result of the Proposed Scheme's completion and operation. As such, it is more appropriate to consider them over the longer term when these potential impacts are expected to reach their fullest expression, even if it is recognised that in many cases they will emerge over time.
- 5.39 The Proposed Scheme's potential impact upon the Margam Mountain Landscape of Special Historic Interest, the nearest (westernmost) elements of which are located circa 1.1km to the east of the PDZ's eastern boundary and rise up the steep slopes to the east of the M4 motorway, is also considered with regard to potential indirect impacts as a result of changes to its setting.
- 5.40 The completion of the AHA and associated site visits/walkovers has demonstrated that there are views of the PDZ looking west from the elevated ground of the Special Landscape. These

are from an area of medieval and later field systems which possess no inter-relationships with the land at the PDZ that contributes to their significance.

- 5.41 Therefore, whilst the PDZ forms part of the surroundings in which the asset is experienced, insofar as there are visual inter-relationships between the PDZ and the Special Landscape, there is no indication that this area of derelict and overgrown former industrial development represents an element of its setting that contributes to its significance. Hence, it is considered to be highly unlikely that the implementation of the Proposed Scheme would give rise to a loss of significance from this non-designated asset.
- 5.42 Therefore, effects on non-designated historic assets are unlikely to be considered significant and will not be considered further within the EIA or reported in the ES.

Limitations and Assumptions

- 5.43 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The archaeological and historic data maintained by the GGAT HER is reasonably accurate and up to date in terms of its use to define the baseline position at the Site regarding non-designated historic assets such as archaeological remains.

Ground Conditions, Soils and Contamination

Technical Baseline

- 5.44 The baseline conditions for this Site have been determined largely from the following reports undertaken for accessible areas of the PDZ. The details for these reports are as follows (which are provided as stand alone Application reports):
- ‘*PROJECT DRAGON: PDZ - Desk Study*’ by TEC, prepared for LanzaTech. Dated May 2022 and up-dated July 2023, report reference: 2111006.002.01D;
 - ‘*PROJECT DRAGON: PDZ: Exploratory Ground Investigation Report*’ by TEC, prepared for LanzaTech. Dated June 2022 and up-dated July 2023, report reference: 2111006.003.01B; and
 - ‘*PROJECT DRAGON: Temporary Construction Facility at Margam Wharf – Desk Study*’ by TEC, prepared for LanzaTech. Dated June 2023 and up-dated July 2023, report reference: 2111006.006.01A.
- 5.45 The PDZ is recorded by the British Geological Survey (BGS)^{4,5} to be underlain by Landscaped Ground (described as mainly redeveloped areas and other where extensive earth moving has occurred). The BGS recorded geology of the Site comprises superficial Tidal Flat Deposits and Blown Sands; underlain by the bedrock geology of the South Wales Middle Coal Measures Formation. Similarly, the Temporary Construction Areas are recorded to be underlain by superficial Tidal Flat Deposits underlain by the South Wales Middle Coal Measures Formation.
- 5.46 NRW⁶ has designated the superficial deposits as a Secondary (Undifferentiated) Aquifer of medium groundwater vulnerability; whilst the bedrock is designated as a Secondary A Aquifer of medium vulnerability. The nearest surface water features are the small ponds located within the PDZ, followed by Port Talbot Docks.
- 5.47 The available historic mapping (Envirocheck[®] Report) indicates the PDZ has comprised numerous industrial land uses/processes since at least 1917, as well as a large pond and a number of heaped areas of unknown constituents formerly present in the west. Historic on-site processes included coal works, railway lines, copper works, metal refinery works/steel ceilings factory, wagon repair shop and associated warehouses, depots and factory buildings.
- 5.48 The available historic mapping (Envirocheck[®] Report) indicates the Temporary Construction Facility at Margam Wharf (TCA1) to have been undeveloped; however, by 1940, the entire site is recorded to have been infilled, with multiple buildings and infrastructure (including railway sidings, tanks, settling tanks, travelling cranes, overhead pipes, chimneys, reservoirs, conveyors, hoppers and Margam Wharf) of the wider Margam (Iron and Steel) Works site. Margam Wharf is shown to be present along the western site boundary.
- 5.49 All buildings within the PDZ and TCA1 are recorded to have been demolished by 2009.

⁴ On-line geological mapping and historic borehole logs. Available at:

<https://mapapps2.bgs.ac.uk/geoindex/home.html? ga=2.75809813.146837851.1657281718-1121376046.1657281718>

⁵ Envirocheck[®] Report for the Production Development Zone, referenced 293349570_1_1, date March 2022.

⁶ On-line interactive map viewer. Available at:

https://maps.cyfoethnaturiolcymru.gov.uk/Html5Viewer210/Index.html?configBase=https://maps.cyfoethnaturiolcymru.gov.uk/Geocortex/Essentials/REST/sites/External_Map_Browser/viewers/EMB_Address/virtualdirectory/Resources/Config/Default&locale=en-gb

- 5.50 The 1899 OS Edition indicates the eastern area of the Temporary Construction Areas to the west of the PDZ (TCA West) to have comprised railways while the western area is recorded to have been undeveloped at that time. Subsequent mapping indicates the western area to have been occupied by a “Hydraulic Power Station” and later a “Works” (1964). By 1968 the railways are recorded to have been removed in the eastern area.
- 5.51 The Temporary Construction Area immediately to the east of the PDZ (TCA East) is recorded to have first been developed by 1940 when a large unnamed building is shown within this area. Railways and the “Phoenix Briquetting Works” are shown on the 1952 OS edition. Subsequent development on the site is recorded to include engineering works, oil storage, liquid oxygen production and electricity sub-stations.
- 5.52 Further detailed baseline information with regards to contamination, including an Envirocheck® Report and historic mapping is provided within the Desk Studies undertaken by TEC.
- 5.53 The Site as a whole, lies within an industrial area with multiple surrounding current and historic industrial land uses and processes, including coal mining, copper works, iron and steel works, docks, warehouses, factories, depots, engineering works and railway sidings/mineral tramways.
- 5.54 Given the historic nature of the Site and surrounding area, the preliminary investigation works undertaken at the PDZ has identified a number of potential on-site contaminants that are risk to both human receptors and controlled waters, detailed in full within the Exploratory Ground Investigation Report prepared by TEC in 2022.
- 5.55 Exploratory ground investigation works within accessible areas⁷ of the PDZ, encountered made ground across the Site to a maximum observed depth of >5.0mbgl, generally comprising dark brown silty gravelly sand with gravel of vesicular slag and concrete, rare clinker, brick and mudstone. Superficial Blown Sand deposits were encountered in localised areas to depths of between 1.2m to >6.5mbgl. Tidal Flat Deposits of variable depth and composition (including organic soils and peat deposits) were observed across the site up to 14.2mbgl, underlain by superficial granular Alluvial Fan Deposits to depths of between 19.6m and 24.5mbgl. Sandstone of the South Wales Middle Coal Measures was encountered locally between 17.7m and >20.35mbgl. Perched groundwater was recorded within the made ground materials across the Production Development Zone, with a shallow groundwater body recorded within the superficial Tidal Flat Deposits as well as a deeper groundwater body encountered within the granular Alluvial Fan Deposits.
- 5.56 Following a Preliminary Risk Assessment, a Detailed UXO Desk Study and Risk Assessment has been completed by Brimstone (ref: DRA-23-1532 rev1, dated 19th April 2023) to assess the risk from Unexploded Ordnance (UXO) across the Site. The assessment records that during WWII, Port Talbot was a strategic target due to the steelworks and coal production facilities that played a vital rôle in supporting the war effort. During WWII the PDZ comprised a metal refinery, a section of a copper works and railway infrastructure. The proximity of Margam Steelworks, railway yards and iron foundry etc in close proximity to the Site as well

⁷ Japanese Knotweed is present across much of the Production Development Zone and this, together with other ecological constraints, limited the scope of the initial investigation, as set out within TEC Report titled ‘Crown Wharf, Port Talbot: Ground Investigation Report’ prepared for LanzaTech and referenced 2111006.003.01 and dated June 2022.

as the copper works within the PDZ and hard coal briquettes factory immediately its east, were identified as Luftwaffe bombing targets.

- 5.57 The ground conditions across the majority of the PDZ are to have been uncondusive to the detection of UXO during WWII. Bombs, including those with delayed-action fuzes, are recorded across the southern part of the docks, i.e. potentially within the PDZ. Potential repair works, indicative of bomb damage, have been observed to the metal refinery adjacent to the site. This, together with the recorded bombing to the copper works and the nearby steelworks, has resulted in the majority of the Site being assessed at a Moderate Risk from German UXBs.
- 5.58 No evidence of bomb damage to the section of the steelworks within the Site boundary has been identified within historical aerial imagery and OS mapping. Given recorded bombing to the steelworks, the risk from German UXBs is slightly elevated and has been assessed as Low-Moderate for the Temporary Construction Facility at Margam Wharf
- 5.59 The Temporary Construction Areas East and West are not included within the Detailed UXO Risk Assessment, but given their proximity to the PDZ are expected to exhibit the same characteristics and therefore also at moderate risk from German UXBs.

Effects Unlikely to be Significant

- 5.60 Based on the technical baseline and understanding of the Proposed Scheme (**Volume 1, Chapter 4** of the ES), the following effects are considered unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES. A factual evidence base has been provided below to support this. Where mitigation has been used to inform this judgement, the identified mitigation has been captured within the EMP provided in **Volume 3**.

Impacts upon Soils and soil resources

- 5.61 As identified above the below ground soil is derived from Landscaped Ground (described as mainly redeveloped areas and other where extensive earth moving has occurred), with superficial Tidal Flat Deposits and Blown Sands. Furthermore, both the PDZ and TCA1 were 'created' as part of the development of Port Talbot Docks in the early 20th Century, with the focus of utilisation as a working dock and has been subject to previous development. As such, the soils and their perceived resource value is considered to be limited. On this basis any potential impacts from the Proposed Scheme are considered to be minimal and therefore not significant and will not be considered further within the EIA or reported within the ES.

Direct effects to human health due to existing on-site contamination (construction and operation)

- 5.62 Through the exploratory investigation works undertaken at the PDZ in 2022, the following Contaminants of Potential Concern (CoPC), in relation to the anticipated commercial end users of the PDZ and construction workers, have been identified within the sampled made ground materials:
- PAHs – benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene;
 - Crocidolite, chrysotile and amosite loose fibres and loose fibrous debris (i.e. asbestos); and

- Leachable CoPCs (heavy metals).
- 5.63 As such, unmitigated there is a potential risk to human health (both future end users and construction workers) from potential exposure to the identified CoPCs and asbestos within the shallow made ground, either through ingestion, inhalation and/or dermal contact pathways.
- 5.64 Measures to protect construction workers from exposure to any contaminated material which is encountered will be required of the appointed contractor under the Construction (Design and Management) Regulations 2015 and other health and safety legislation. Appropriate strategies / protocols will be put in place in line with relevant legislation (such as the Control of Asbestos Regulations⁸) and best practice (CIRIA 733 Asbestos in Soil and Made Ground⁹) [T1, T6]. Additionally, measures will be incorporated into the CEMP, including the use of Personal Protective Equipment (PPE), the preparation of method statements and provision of environmental awareness training, in order to ensure that construction activities are undertaken in line with best practice measures (such as CIRIA Handbook C741 Environmental Good Practice on Site, 2015) accounting for the identified CoPCs [T1, T6]. Although there is limited understanding of the potential for contamination within the temporary construction area, in line with **Paragraph 4.22**, a ground investigation and associated assessment will be undertaken to determine the existing nature and condition of this area to ensure their return to pre-use conditions, or appropriate condition agreed in advance¹⁰. Furthermore, appropriate construction protective measures will be implemented (i.e., ground barrier or storage facilities) to ensure no potential accidental release of contamination associated with construction related activities, or disturbance/mobilisation of existing contamination [T6]. As such, impacts to construction workers in these areas is limited and suitably controlled. At worst the need for additional measures to be adopted will be set out as part of the CEMP.
- 5.65 Operationally, it is anticipated that much of the PDZ will be laid to hardstanding or within the footprint of proposed structures, which will mitigate the potential pollution pathways to future users of the Site (i.e., effectively capping any remaining contamination). Within areas of soft landscaping (although such areas are limited) or where made ground remains once finished site levels have been achieved, a suitable cover system will be implemented to remove potential exposure to contamination. Appropriate mitigation measures with respect to identified contamination will be set out as part of a remediation strategy [T11], submitted to NPTCBC for approval prior to commencement of construction works on-site and/or occupation of the Site. The remediation strategy will be informed by the existing and a main ground investigations to understand the extent and nature of contamination in relation to the developable areas [T11]. As noted above, where required appropriate mitigation measures will be specified and these will be implemented during the construction stage.

⁸ Control of Asbestos Regulations 2012 No. 632. Available at: <https://www.legislation.gov.uk/ukxi/2012/632/contents/made>.

⁹ CIRIA (2014). Asbestos in soil and made ground: a guide to understanding and managing risks (C733).

¹⁰ The temporary construction area is known to contain Japanese Knotweed which will be subject to an existing management strategy by the existing land owner ABP. Therefore, post-use conditions will likely reflect the need for these areas to be clear of Japanese Knotweed.

- 5.66 Therefore, direct effects to human health due to existing on-site contamination during construction and operation are considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Accidental release of contamination (construction and operation)

- 5.67 During the construction stage of the Proposed Scheme, there is a potential for spillages (such as oil, fuel, cement, chemicals etc.), soil erosion or the generation of suspended solids during construction activities (including excavations and plant/wheel washing).
- 5.68 Such effects can be controlled through best practice measures, including (where applicable): bunded storage; designated wheel washing areas; settling basins; screening stockpiles of materials; dampening exposed soils as appropriate; and set out requirements for ongoing monitoring and liaison (with the local community, the NRW and NPTCBC, as appropriate), as set out in the EMP [T6]. Such measures will be defined within the CEMP for submission and approval in advance of construction activities commencing on Site.
- 5.69 During operation, the processing facility will be a closed loop system, so any potential accidental release of contamination will be in relation to the storage of chemicals. All storage tanks will be industry standard tanks with appropriate bunding [T13].
- 5.70 Therefore, accidental release of contamination is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Direct effects to Controlled Waters (Secondary Aquifer and docks) due to migration of existing contamination (construction)

- 5.71 In addition to the CoPCs noted above, the exploratory investigation identified elevated leachable CoPCs (heavy metals) within made ground, as well as elevated CoPCs (heavy metals, PAHs, TPHs and sulphate) within perched water (made ground) and upper groundwater (superficial Tidal Flat Deposits). Notwithstanding this, no organic concentrations (including TPHs, PAHs, VOCs and SVOCs) were recorded within the sampled deeper groundwater (Alluvial Fan Deposits), with concentrations recorded below limits of detection for all samples of the deeper groundwater. Localised, marginal exceedances of limited heavy metals were recorded within the deeper groundwater sampled, in relation to conservative Environmental Quality Standards (EQS) values.
- 5.72 Based on the limited data obtained to-date, there is no evidence of gross or dissolved phase organic contamination migration to the deeper groundwater body. Furthermore, given the generally cohesive nature of the superficial tidal flat deposits, significant vertical and horizontal contaminant migration is currently considered likely to be limited. However, it is recognised that additional ground investigation, monitoring and assessment would be required to fully characterise the Site.
- 5.73 Unchecked there is the potential risk to controlled waters through potential vertical and horizontal migration of leachable contaminants. It is recognised that the majority of the structures within the PDZ will need to be piled due to the recorded ground conditions and there is the need for sheet piling within the construction wharf/jetty, therefore, a Foundation Work Risk Assessment in accordance with the methodology outlined in the Environment Agency's Report titled "Piling into Contaminated Sites", February 2002 and the National Groundwater and Contaminated Land Centre Report NC/99/73: "Piling and penetrative ground improvement methods on land affected by contamination: Guidance on

pollution prevention” will be undertaken to determine the most appropriate piling methodology. The CEMP will use best practice guidance such as the Pollution Prevention Guidelines (Environment Agency) and Control of Water Pollution from Construction Sites (CIRIA), and incorporate on-going monitoring by the environmental clerk of works throughout the construction stage [T1, T6]. Through the implementation of best practice measures as part of the construction process and detailed within the CEMP, such risks can be appropriately managed so as to not result in a significant effect.

- 5.74 Therefore, direct effects to controlled waters due to migration of contamination during construction is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Indirect effect to human health due to potential ingress and accumulation of bulk ground gas (construction and operation)

- 5.75 Potential sources of bulk ground gas have been identified as part of the preliminary assessment which include made ground, observed to a maximum depth of 5.0mbgl, and organic soils/peat layers within the superficial Tidal Flat Deposits and potentially historic coal mining activities. Initial investigation and ground gas monitoring indicate the PDZ may potentially be considered as Characteristic Situation 3, although further investigation and monitoring in accordance with BS8485:2015+A1:2019 is required to confirm this.
- 5.76 Therefore, there is the potential for risk to human health (end users and construction workers) and proposed structures through the potential ingress and accumulation of bulk ground gas. Nonetheless, such risks can be mitigated through the adoption of best practice measures as part of the construction stage (being implemented as part of the CEMP) and ensuring all proposed structures are designed in accordance with BS8485 and CIRIA C735 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases (where required), as well as CIRIA Report C572: Treated ground engineering properties and performance; British Research Establishment document FB75: Building on Fill – Geotechnical Aspects and BS 6031:2009: Code of Practice for Earthworks [T1, T6]. Adherence to such measures should mitigation effects sufficiently that they would not be considered significant.
- 5.77 Therefore, indirect effects to human health due to potential ingress and accumulation of bulk ground gas during construction and operation is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Direct effects to human health due to presence of UXO

- 5.78 The Detailed UXO Risk Assessment report (submitted as a stand alone Application report)) concluded that a moderate risk from UXO exists for the area of the PDZ and appropriate UXO mitigation measures will be required to be in place during the investigation/construction phases of the works [T9]:

Risk Mitigation Measure	Recommendation
UXO Safety Awareness Briefings	Prior to all intrusive works commencing
Non-Intrusive Magnetometer Probe Survey	Open excavations on greenfield land within the Moderate Risk zone

Risk Mitigation Measure	Recommendation
Intrusive Magnetometer Probe Survey	Of all pile positions within the Moderate Risk zone
EOD Engineer - On Site Supervision	Watching brief of all open excavations and magnetometer survey of exactions within the Moderate Risk zone.

- 5.79 The Temporary Construction Areas East and West are not included within the Detailed UXO Risk Assessment but considered to be similar characteristics to the PDZ given their proximity and therefore require the same level of mitigation specified above and discussed further below.
- 5.80 Prior to the start of construction, a non-intrusive magnetometer survey will be undertaken across the PDZ and, in particular, with the areas of undeveloped open ground identified within the WWII mapping [T9]. While potentially inhibited by the recorded presence of slag materials within the ground, where anomalies are recorded there would be the need for further investigation to confirm/remove the risk.
- 5.81 Once a piling layout has been finalised, an intrusive magnetometer survey would be completed, comprising CPT testing at 2m centres to depth of 12m within the purposed pile layout [T9]. Again, where anomalies are recorded there would be the need for further investigation to confirm/remove the risk.
- 5.82 TCA1 is classified as low risk from UXO and therefore no specific mitigation measures are required within this area.
- 5.83 Adoption of such measures will ensure any risk associated with encountering UXO is as low as possible. Therefore, direct effects to human health due to presence of UXO during construction is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Flood Risk and Hydrology

5.84 Extensive preliminary works in relation to flood risk and hydrology have been undertaken and therefore informed the understanding of the technical baseline and likelihood of significant effects associated with the Proposed Scheme. As such, this section is supported by the following documents, which form technical appendices to the EIA Scoping Report:

- *Project Dragon Flood Consequences Assessment* (submitted as a stand alone Application report), prepared in accordance with Planning Policy Wales requirements to assess flood risk from all sources both to and from the proposed scheme. Herein referred to as the FCA; and
- *Project Dragon - Outline Drainage Strategy* (submitted as a stand alone Application Report), prepared as a pre-application consultation to NPTCBC SuDS Approval Body, outlining the principles of the site drainage strategy.

5.85 These documents should be read in conjunction with the summary information provided in this section. Furthermore, it should be noted that the above documents will be updated and submitted as part of the Application, albeit the general conclusions of the reporting are expected to remain the same.

Technical Baseline

5.86 There are no formal waterbodies, rivers, ordinary watercourses or connected surface water drainage assets within the PDZ and Temporary Construction Area of the Site. Topographic survey has identified a shallow pond within the lowest area of scrubland in the PDZ, which is not hydrologically linked to any other water features. Historical uses of the PDZ may result in some disused drainage artefacts on-site, but these are assumed to be redundant. Similarly, the Site is not currently serviced by connected foul drainage infrastructure. The 0.3km portion of Phoenix Way Supporting Infrastructure to the north of the PDZ is served by highway drainage assets connected to the wider dock road system, most likely discharging into the Port Talbot Docks.

5.87 Two Natural Resources Wales (NRW) designated Main Rivers are located in close proximity to the Site, as shown in Figure 5.1 of the EIA Scoping Report (**Appendix 2.1**). The River Afan is located 740m to the north west of the PDZ and the Ffrwd Wyllt is located 80m north of the TCA1. The Ffrwd Wyllt flows into the Port Talbot Docks approximately 200m from the proposed Marine Unloading/Loading Facility. The Afan Estuary is approximately 25m to the north of the PDZ and 15m west of the Temporary Construction Area. The new Marine Unloading/Loading Facility will be located within the Port Talbot Dock, which currently forms part of the Afan Estuary. The Site does not benefit from the presence of existing flood defences.

5.88 Topographical survey¹¹ of the PDZ indicates that the Site topography therefore naturally drains northwards towards Phoenix Way and Crown Wharf. NRW 1m Light Detection and Ranging (LiDAR) data shows that ground levels for TCA1, TCA West and TCA East naturally drain towards the dock road system and the Port Talbot Docks.

¹¹ AP Land Surveys, APLS-1174 Harbourside Port Talbot, Survey Control & Topographic Survey Report, December 2021.

- 5.89 The *Crown Wharf, Port Talbot: Desk Study*¹² by TEC completed in May 2022 indicates that the superficial geological deposits at the Site are recorded as a Secondary (Undifferentiated) Aquifer and the underlying solid geology is designated as a Secondary A Aquifer. Both are classified to be of medium groundwater vulnerability. The underlying ground conditions therefore permit the infiltration of pluvial surface water into the groundwater body. The Envirocheck Report included as part of the geotechnical desk study reports that there are no groundwater abstractions and two discharge consents to groundwater are located within 500m of the Site. There are 19 surface water abstractions within 500m of the Site and 27 discharge consents to surface water within 250m of the Site.

Flood Risk

- 5.90 The Crown Wharf FCA¹³ and Outline Drainage Strategy provides a detailed description of the baseline flood risk from all sources at the site. The FCA uses a combination of sources, including the current TAN-15 Development Advice Map (DAM), the Flood Map for Planning (FMfP), NRW Flood Risk Assessment Wales (FRAW) mapping and detailed site-specific hydraulic modelling based upon NRW's Port Talbot TufLOW Hydraulic Model.
- 5.91 Figure 5.3 of the EIA Scoping Report (**Appendix 2.1**) shows the results from the NRW Flood Map for Planning for Rivers (fluvial) and Figure 5.4 of the EIA Scoping Report (**Appendix 2.1**) shows the NRW Flood Map for Planning from the Sea (tidal). The FMfP results are considered to apply the most precautionary indicator of flood risk from the available evidence base. Such precautionary flood outlines result from a number of reasons, including: the generic modelling methods used to create the mapping; an allowance for 100 years of climate change; and by not including the operation of flood defences in the modelling process.
- 5.92 The FMfP indicates that a small portion in the north of the PDZ, where the ground levels are lower, is located within Flood Zone 2 for flooding from rivers, this equates to between a 0.1% and 1% Annual Exceedance Probability (AEP). The rest of the PDZ is located in Flood Zone 1 with very low risk of flooding from rivers (less than a 0.1% AEP). With regards to flood risk from the sea, a larger section of the north of the PDZ is located in Flood Zone 2 (with between 0.5 and 0.1% AEP) and Flood Zone 3 (more than 0.5% AEP), with the rest of the Site at very low risk of flooding from the sea.
- 5.93 TCA1, as shown in the FMfP, is mostly located in Flood Zone 3 for flooding from rivers (more than 1% AEP for flooding) and Flood Zone 2 for flooding from the sea. TCA West is located in Flood Zone 2 for flooding from the sea, whilst TCA East is partially located within this zone.
- 5.94 Approximately one third of the Phoenix Way Supporting Infrastructure located on the northern boundary of the PDZ is within Flood Zone 2 for flooding from rivers and Flood Zone 3 for flooding from the sea.
- 5.95 As mentioned above, the FMfP includes a cautious approach to the representation of flood risk. Detailed baseline flood modelling was carried out to inform the FCA for the PDZ, which uses more sophisticated modelling approaches to represent flood mechanisms around the

¹² Tweedie Evans Consulting Ltd (2022). *Crown Wharf, Port Talbot Desk Study*.

¹³ P&C Project Dragon FCA 29Jul2022 V1.

Site, applying a much smaller spatial scale to the model calculations, using updated hydrology inputs, Welsh Government's latest climate change guidance¹⁴.

- 5.96 The results of this modelling show that many of the areas identified to be at risk in the FMfP are flood free in the baseline up to the 0.1% AEP fluvial event¹⁵ and the 0.1% AEP tidal event with the application of climate change, and therefore at very low flood risk. This includes the Temporary Construction Areas. Furthermore, the detailed baseline flood modelling shows that the PDZ and Phoenix Way Supporting Infrastructure are flood free in the 1%% AEP fluvial event and in the 0.5% AEP tidal event with climate change and shows a vastly smaller area of flooding experienced in the 0.1% AEP fluvial event and 0.1% AEP tidal event with climate change. Detailed flood modelling results for the 0.1% AEP fluvial event and the 0.1% AEP tidal event with climate change have been provided in Figure 5.6 and Figure 5.7 of the EIA Scoping Report (**Appendix 2.1**).
- 5.97 Figure 5.5 of the EIA Scoping Report (**Appendix 2.1**) shows the NRW Flood Map for Planning from Surface Water. Baseline flood risk is not considered to be significant for all areas within the Site. Small isolated pockets of Flood Zone 3 are identified within the PDZ and the Temporary Construction Areas. However, these correspond to localised depressions in ground elevation and ponds across the present sites. These areas are not linked to any surface water drainage pathways.
- 5.98 The Envirocheck Report included as part of the *Crown Wharf, Port Talbot: Desk Study* by TEC identifies that the Site has the potential for groundwater flooding for the Proposed Scheme situated below ground level with some of the Site having the potential for groundwater to occur at the surface. Overall the baseline groundwater flood risk is classified as low.
- 5.99 The NRW Flood Map for Planning¹⁶ for Flood Risk from Reservoirs identifies that approximately 50% of TCA1 is located within an area at risk from reservoir flooding. The rest of the Site, including the PDZ, is not identified to be at risk of reservoir flooding. The source of the reservoir risk is the Cwmwernderi Reservoir, owned by Dŵr Cymru Welsh Water (DCWW) and situated approximately 6km from the Site. The regulatory nature of reservoir management means that the likelihood of a reservoir failure and overall reservoir flood risk is very low.
- 5.100 The NPTCBC Flood Risk Management Plan does not contain evidence of historic sewer flooding on or close to the Site. It can therefore be concluded that the risk of sewer flooding at the Site is very low.

Water Quality - Water Framework Directive (WFD)

- 5.101 The nearest WFD water bodies and their WFD status are listed in **Table 2.3.2** below and shown on Figure 5.2 of the EIA Scoping Report (**Appendix 2.1**).

¹⁴ Flood Consequences Assessments: Climate change allowances. Available at: https://gov.wales/sites/default/files/publications/2021-09/climate-change-allowances-and-flood-consequence-assessments_0.pdf

¹⁵ Climate change is not required to be assessed for the 0.1% AEP fluvial event in accordance with Welsh Government guidance as outlined in TAN-15, Available at: <https://gov.wales/technical-advice-note-tan-15-development-and-flood-risk-2004>

¹⁶ Flood Map for Planning. Available at: <https://flood-map-for-planning.naturalresources.wales/>

Table 2.3.2: Cycle 3 Status of WFD Waterbodies

WFD Waterbody	WFD reference	Distance from Site (m)	Description	Cycle 3 2021 Overall Status	Cycle 3 2021 Ecological Status	Cycle 3 2021 Chemical Status
Afan Estuary including Docks	GB 541005800600	0	Transitional - Heavily Modified Waterbody	Moderate	Moderate	Good
Ffrwd Wylt - headwaters to tidal limit	GB 110058026100	80	River - Heavily Modified Waterbody	Moderate	Moderate	High
Afan - confluence with Pelenna to tidal limit	GB 110058026110	740	River - Natural	Good	Good	High
Swansea Carboniferous Coal Measures	GB 41002G201000	0	Groundwater - Natural	Poor	Good	Poor

- 5.102 The 'Ffrwd Wylt - headwaters to tidal limit' and 'Afan - confluence with Pelenna to tidal limit' waterbodies are both upstream of the Site, prior to the two rivers discharging into Port Talbot Docks. They are therefore not considered to be hydrologically linked to the Site.
- 5.103 The Afan Estuary including Docks waterbody is immediately adjacent to the permanent and temporary development areas and downstream of the Site's overland flow pathway. The waterbody is therefore identified as a water quality receptor to the impacts of the Proposed Scheme. The element driving the overall 'Moderate' WFD classification for the 'Afan Estuary including the Docks' waterbody is hydromorphology. This relates to the impact of the controlled hydrological regime of the dock and feeder watercourses and their ecological functioning. The hydrological controls are located upstream of the Proposed Scheme and are not influenced by the Site activities.
- 5.104 The 'Swansea Carboniferous Coal Measures' WFD Groundwater body is hydrologically linked to the Site as a result of the potential for infiltration of surface runoff into the superficial and bedrock aquifers. This groundwater body is therefore identified as a water quality receptor to the impacts of the Proposed Scheme.
- 5.105 The Proposed Scheme would require discharge connection to DCWW assets associated with foul water from on-site buildings/structure, but not inclusive of 'process water'. As such, the DCWW assets and resultant receptors to DCWW controlled discharge become indirect receptors to the water quality impacts associated with the foul water discharges from the Proposed Scheme.

Effects Unlikely / Not Significant

- 5.106 Based on the technical baseline and understanding of the Proposed Scheme (**Volume 1, Chapter 4** of the ES), the following effects are considered unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES. A factual evidence base has been provided below to support this. Where mitigation has been used to inform this judgement, the identified mitigation **Volume 3**.

Flood risk

- 5.107 The baseline conditions indicate that a portion of the PDZ and Phoenix Way Supporting Infrastructure is at risk of flooding from fluvial and tidal sources. As such, the Proposed Scheme could have the potential to impact flood risk receptors, including site users, assets and infrastructure, during the permanent site operations, if mitigation measures are not in place. The risk from tidal sources is only present when climate change impacts are taken into account. The risk from fluvial sources is very low (0.1% AEP) with predicted flood depths well within the tolerable levels set out in A1.15 of TAN-15. Therefore, mitigation measures are not required for flood risk during the construction stage.
- 5.108 The permanent site operations that form part of the PDZ are required to complete a Flood Consequence Assessment (FCA) to demonstrate how the development proposals will manage the risk of flooding on Site and the potential for detrimental impacts off-site for the lifetime of the Proposed Scheme, in accordance with the requirements of Welsh Government Technical Advice Note 15¹⁷ (TAN15) **[P3]**. This has been outlined in the JBA Consulting Crown Wharf FCA¹⁸. To manage residual flood risk and provide a higher standard of protection than required under TAN-15, it is proposed that ground levels across the Site will be raised to above the 0.1% AEP tidal flood level with a climate change allowance, and 0.1% AEP fluvial flood event, in accordance with the Welsh Government climate change guidance¹⁹ **[P2]**. This equates to a minimum ground level of 7.5mAOD, which much of the Site already exceeds, except for isolated low lying areas in the centre, and the north of the Site. An assessment of third-party impacts as a result of ground raising has also been undertaken using detailed flood modelling. The results reported in the FCA demonstrate that ground raising across the Site has a negligible impact on flood depths off-site. In view of the mitigation proposed **[P2, P3]** and to be delivered as part of the Proposed Scheme, effects on flood risk receptors from the operational stage of the PDZ are considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.
- 5.109 The scheme proposals for the Phoenix Way Supporting Infrastructure include the construction of road access points to the PDZ and vehicle turning circles. The detailed post-development flood modelling shows the road is flood free in the 0.5% AEP tidal event with climate change and a small portion of this road (approximately 500m²) experiences flood depths up to 0.25m in the 0.1% AEP tidal event with climate change. The flood extents and depths in the 0.1% AEP tidal event with climate change are presented in Figure 5.8 of the EIA Scoping Report (**Appendix 2.1**), with the flood extents and depths in the 0.1% AEP fluvial event presented in Figure 5.9 of the EIA Scoping Report (**Appendix 2.1**). Welsh Government TAN15 Acceptability Criteria (TAN15 A1.14) states that sites should be flood free in the 0.5%

¹⁷ <https://gov.wales/technical-advice-note-tan-15-development-and-flood-risk-2004>

¹⁸ P&C Project Dragon FCA 29Jul2022 V1.

¹⁹ https://gov.wales/sites/default/files/publications/2021-09/climate-change-allowances-and-flood-consequence-assessments_0.pdf

AEP tidal event with an allowance for climate change and the 1% AEP fluvial event with an allowance climate change. Residual flood risk during the 0.1% AEP tidal event with climate change and 0.1% AEP present day fluvial event should not exceed 0.6m (TAN15 A1.15). The detailed flood modelling results for the Phoenix Way Supporting Infrastructure show that the site meets these flooding criteria. Significant effects to flood risk receptors in the Phoenix Way Supporting Infrastructure area of the Site are therefore considered unlikely for the following reasons:

- Flood extent and depths meets the Acceptability Criteria as stated in TAN-15;
- Predicted flooding during the 0.1% AEP tidal event with climate change and 0.1% AEP fluvial covers a very small area of the access road to shallow depths; and
- Site use is ancillary road operations, with no buildings or production areas impacted. Therefore, the risk of flood impacts to site users, operations and assets could be adequately mitigated by site operational procedures and flood warnings as required under the Environmental Permit operational management procedures and associated Environmental Management System (EMS).

- 5.110 The introduction of significant areas of hardstanding across the Site results in the potential for surface water flood impacts and likely significant effects to on-site users and adjacent developments during permanent operations if not appropriately mitigated. The Proposed Scheme includes the application of Sustainable Drainage Systems (SuDS) **[P3]**. The SuDS drainage strategy shall be required to demonstrate how the Proposed Scheme meets the requirements of the Welsh Government Statutory Standards for Sustainable Drainage Systems and will manage surface water runoff quantities to mitigate the risk of flooding impacts. Approval of the drainage strategy is required by NPTCBC SuDS Approval Body (SAB). The SAB approved drainage strategy is considered to form a primary mitigation measure **[P3]**, with a high degree of confidence assigned to the design and implementation of the measures detailed within. Therefore, effects from surface water flooding are considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.
- 5.111 During the construction stage, the risk of surface water flooding will also be mitigated. A 'Drainage Phasing Plan' and 'Construction Environmental Management Plan' for construction of the Site shall be required to indicate early implementation of drainage features across the Site and shall form part of the full SAB application for surface water drainage approval by the SAB. The importance of the sequencing of the drainage features will also inform the CEMP, so as to ensure the mitigation is implemented **[T2]**. The implementation of the drainage strategy at the earliest stage will mitigate the risk of increased overland flows and impediments to runoff pathways on site causing a localised increase in flood risk.
- 5.112 The baseline conditions identified that TCA1 is at risk of reservoir flooding. The Reservoirs Act 1975 requires that all reservoirs as defined under the Act are inspected for safety by a suitably qualified reservoir engineers on a routine basis and Section 10 reports submitted to the appropriate authority. Where steps to maintain or remediate the reservoir are required, these are recorded in Section 12 reports with a fixed timescale for remediation. This legislative instrument provides a high degree of certainty that the risk from reservoir flooding is suitably managed and significant effects are unlikely.
- 5.113 The baseline conditions also identified a low risk of groundwater flooding across the Site. The Proposed Scheme includes ground raising (Paragraph 4.19 of the EIA Scoping Report

(Appendix 2.1)) [P2] and do not incorporate any basement level development that would be particularly vulnerable to the impacts of basement flooding. Consequently, groundwater flooding is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Water quality

- 5.114 The 'Afan Estuary including Docks' waterbody and the 'Swansea Carboniferous Coal Measures' groundwater are identified to be the primary potential receptors for water quality impacts arising from the Proposed Scheme. The Proposed Scheme involves industrial operations which, if unmanaged, have the potential to cause indirect diffuse pollution from contaminated site surface water, indirect diffuse pollution from controlled discharges, and acute pollution from uncontrolled releases/spillages of polluting substances on site. These impacts could cause pollution to the groundwater body receptor via direct infiltration to ground, or pollution to the Afan Estuary via surface water drainage routes and discharge points. Such impacts would likely to cause significant effects on the water quality receptor if not appropriately mitigated.
- 5.115 The Proposed Scheme will include measures to control or mitigate these measures as outlined in the site drainage strategy [P3] (see **Volume 1, Chapter 4** of the ES). The outline drainage strategy includes two main surface water drainage systems across the Site [P3]. In ancillary areas, where contamination risk is low, SuDS will be used for water quality treatment of runoff. This includes hardstanding around operational buildings, the flare, roads, amenity spaces and all areas outside of bunded storage. Following SuDS water quality treatment, the site surface water will be discharged to the Afan Estuary at Crown Wharf. The required water quality treatment processes have been designed to meet the Welsh Government Statutory Standards for Sustainable Drainage Systems and The SuDS Manual (C753) as appropriate for the industrial nature of the Site [P3]. In areas where contamination is anticipated, surface water shall be directed to the on-site wastewater treatment works.
- 5.116 Water with the potential to be significantly contaminated by process operations will be treated as process water requiring treatment via an on-site wastewater treatment works, and will not be discharged as surface water into the SuDS surface water drainage system. The Proposed Scheme will include pollution prevention and control measures to mitigate the risk of acute water pollution from spillage events [T12]. In particular, these include bunding of hydrocarbon tanks and storage equipment used for potentially contaminating substances and the use of sumps or bunds for all equipment with the potential for leaks. In addition, there shall be an atmospheric storage tank for the purposes of storing firefighting water. These mitigation measures will form a regulatory requirement within the corresponding Environmental Permit and therefore considered to be tertiary mitigation for the risk of pollution to surface water discharge [T12].
- 5.117 The Site is located in the immediate vicinity of a combined public sewerage system which drains to Afan New Works Wastewater Treatment Works (WwTW). DCWW have been consulted to consider the strategic impact of the Proposed Scheme on the wider capacity of DCWW water resource assets for both water supply and foul/effluent drainage disposal. DCWW have confirmed that *"No problems are envisaged with the Waste Water Treatment Works for the treatment of domestic discharges from this site"*. The option of discharging process effluent to the DCWW system is unlikely at this stage and has not been investigated in any detail, which will be documented clearly in the ES and supporting reporting for clarity

purposes. If process effluent were to be sent to DCWW's system it would need to be treated and discharged in compliance with their existing Environmental Permit and therefore considered to be tertiary mitigation for the risk of pollution to surface water discharge **[T12]**. DCWW have advised that reinforcement works will be required to the portable water supply to serve the Site. As part of the formal planning consultation process, DCWW will seek to ensure that an appropriate hydraulic assessment (and any associated reinforcement works) is completed in advance of the determination of the application or controlled by way of planning condition.

- 5.118 With the mitigation measures outlined for the control of diffuse and acute water pollution impacts, the potential for significant effects on water quality receptors during the operational stage of the Proposed Scheme is not considered to be significant.
- 5.119 During the construction stage, impacts on site drainage could have significant effects on water quality receptors if unmitigated. The impacts during construction are expected to be temporary and would relate to the following activities:
- Material export and import;
 - Temporary storage of materials;
 - Groundworks for foundations and services;
 - Construction of hard standing across the site, process infrastructure and buildings; and
 - Increased vehicle movements with the potential to track polluting materials.
- 5.120 During these activities, there will be considerable disturbance to the existing ground and the creation of dust and silt. This could lead to increased sediment loads and leaching of existing contaminants into surface runoff prior to the construction of the formalised SuDS drainage system. There is also a risk of uncontrolled discharge of oils, hydrocarbons, cementitious or chemical pollutants from construction operations that could impact the water quality of receptors.
- 5.121 The compaction of ground materials, temporary stockpiling and creation of hardstanding prior to fully operational drainage infrastructure could give rise to increased overland flows and impediments to runoff pathways on site. These impacts could cause changes to existing drainage conditions and localised surface water flooding. Such impacts are thought to be constrained within the Site and are not anticipated to affect off-site flood risk receptors.
- 5.122 Mitigation measures for the impacts listed above will be implemented by adherence to strict protocols relating to the method of construction. A CEMP will be in place as agreed in advance of construction works occurring **[T1]**. The CEMP will use best practice guidance such as the Pollution Prevention Guidelines (Environment Agency) and Control of Water Pollution from Construction Sites (CIRIA), and incorporate on-going monitoring by the environmental clerk of works throughout the construction stage **[T1, T2]**. The CEMP and measures contained within can be regarded as tertiary mitigation as these must be approved by NRW as the relevant authorising body, and the SAB as part of their statutory duties under the SuDS legislation. The adoption of appropriate pollution prevention measures and good construction practices as defined in the approved CEMP **[T1, T2]** should ensure that significant effects are unlikely during the construction stage.

- 5.123 The proposed drainage strategy for the Site does not include any controlled discharge to groundwater as all site surface water will either be discharged to the Afan Estuary at Crown Wharf, or re-used in site processing. If required, all SuDS assets shall be lined to reduce the risk of downward infiltration of water into underlying soils, which would increase the risk of mobilisation of existing contaminants [P3]. Furthermore, the risk of groundwater pollution from infiltration of polluted surface water of spillages of polluting substances is adequately managed by the proposed mitigation measures outlined above [P3]. Therefore, effects on existing groundwater abstractions and discharges are considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.
- 5.124 A Water Framework Directive assessment is therefore also not required for the direct effects generated by the Proposed Scheme (as reported above).

Summary of Effects

- 5.125 **Table 2.3.3** below summarises the potential impacts for each identified receptor, their likely significant effects, mitigation measures to be implemented and residual effects.

Table 2.3.3: Summary of Impacts and Significant Effects

Potential impacts	Receptor	Nature of effect	Mitigation measures	Residual significant effects
Construction stage				
Flood risk - from surface water	Less vulnerable development and site users on site (Proposed Scheme) and off-site adjacent developments.	Direct, temporary, short term Moderate	SAB compliant drainage strategy Approved CEMP	Not significant
Water quality impacts - sedimentation and pollution events	WFD water body - Afan Estuary including Docks WFD groundwater body - Swansea Carboniferous Coal Measures	Direct and indirect, permanent, short term Moderate/ Major	Approved CEMP Environmental Permit conditions	Not significant
Operational stage				
Flood risk – fluvial	Less vulnerable development and site users on site	Direct, Permanent, Long term	Production Development Zone site raising to	Not significant

Potential impacts	Receptor	Nature of effect	Mitigation measures	Residual significant effects
Flood risk – surface water	(Proposed Scheme) and off-site adjacent developments.	Moderate	7.5mAOD as defined in FCA SAB compliant drainage strategy	
Water quality impacts - sedimentation and pollution events	WFD water body - Afan Estuary including Docks	Direct and indirect, permanent, short term Moderate/ Major	SAB compliant drainage strategy NRW Environmental Permit conditions	Not significant

5.126 Effects of the Proposed Scheme with regards to flood risk and drainage are not considered to be Significant as a result of planned tertiary mitigation measures. In particular, this includes implementation of:

- A robust and monitored CEMP to mitigate potential impacts during construction; and
- A SuDS site drainage strategy (including discharge license if necessary) approved by the SAB in accordance with the industry best practice outlined in CIRIA C753 SuDS Manual for management of runoff volumes, rate and water quality treatment.

Limitations and Assumptions

5.127 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The Proposed Scheme will be implemented and constructed in accordance with the proposed layout, ground levels and drainage features;
- The Proposed Scheme will be implemented and constructed as per the details of an approved SAB compliant drainage strategy in accordance with the Welsh Government Statutory Standards for Sustainable Drainage Systems²⁰ and The SuDS Manual (C753);
- All environmental regulatory consents and an Environmental Permit will be obtained from NRW prior to construction (where necessary) and adhered to throughout construction and operation. The site Environmental Permit will identify all discharges to controlled waters;

²⁰ Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems. Available at: <https://gov.wales/sites/default/files/publications/2019-06/statutory-national-standards-for-sustainable-drainage-systems.pdf>

- The outcomes of the JBA Consulting Crown Wharf Flood Consequence Assessment are accepted by NRW and represent the most likely scenario for flood risk to and from the Site;
- A CEMP will be developed that adequately incorporates measures to prevent the risk of pollution to surface water from construction activities, as approved by NRW. Construction mitigation measures will follow standard industry best practice for CEMP, for example with reference to the following standards and requirements:
 - CIRIA Report C532 2001: Control of water pollution from construction sites – guidance for consultants and contractors;
 - CIRIA Report C624, 2004: Development and Flood Risk – guidance for the construction industry);
 - CIRIA Report C741 2015: Environmental good practice on site; and
 - Environment Agency: Pollution prevention guidance²¹ for business.
- The WFD Cycle 3 information for the relevant waterbodies is the latest information available regarding water quality data; and
- DCWW will manage the necessary mitigation measures for water supply and sewerage discharge in association with the facilities required for the proposed site activities. DCWW requirements will be identified through consultation and newly constructed assets and discharges to DCWW services will meet DCWW consenting requirements. Further clarification will be provided through the ES, in terms of the specifics to be adopted as part of the Proposed Scheme.

²¹ Pollution prevention for business. Available at: <https://www.gov.uk/guidance/pollution-prevention-for-businesses>

Transport

Technical Baseline

5.128 With respect to transport an appropriate technical study area has been identified which is considered to cover all potential road links where a significant effect could be likely, and engagement with NPTCBC, and includes the following key junctions on route to and from the M4:

- M4 Junction 41;
- A48 Heilbronn Way / Car Park Access / A4241 / Water Street;
- A4241 / Industrial Unit Access / Harbourside Road / Industrial Unit Access (West);
- A4241 / A4241 Harbour Way / North Bank Road;
- A4241 Harbour Way / Oakwood Road / Llewellyn's Road;
- A4241 Harbour Way / Port Talbot Steelworks West Gate Access;
- A4241 Harbour Way / Port Talbot Steelworks Main Gate Access;
- A4241 Harbour Way / A48 Margam Road / Access Road; and
- M4 Junction 38.

Accidents and Safety

5.129 Personal injury road traffic accident records have been obtained for the most recent five-year period available at junctions / links within the study area, which is shown on the accident plan presented in Figure 5.6 of the EIA Scoping Report (**Appendix 2.1**) and summarised in **Table 2.3.4** below.

Table 2.3.4: Accident Record Summary

Junction	Fatal	Serious	Slight	Total
M4 Junction 41 Junction	0	0	2	2
A48 Heilbronn Way / Car Park Access / A4241 / Water Street Junction	0	0	3	3
A4241 link between the A48 Heilbronn Way / Car Park Access / A4241 / Water Street Junction and the A4241 / Industrial Unit Access / Harbourside Road / Industrial Unit Access (West) Junction	0	1	0	1
A4241 / Industrial Unit Access / Harbourside Road / Industrial Unit Access (West) Junction	0	0	0	0
A4241 / A4241 Harbour Way / North Bank Road Junction	0	0	2	2
A4241 Harbour Way / Oakwood Road / Llewellyn's Road Junction	0	1	1	2

Junction	Fatal	Serious	Slight	Total
A4241 Harbour Way link between the A4241 Harbour Way / Oakwood Road / Llewellyn's Road Junction and the A4241 Harbour Way / West Gate Access Junction	0	1	0	1
A4241 Harbour Way / West Gate Access Junction	0	0	0	0
A4241 Harbour Way link between the A4241 Harbour Way / West Gate Access Junction and the A4241 Harbour Way / Main Gate Access Junction	0	0	1	1
A4241 Harbour Way / Main Gate Access Junction	0	0	3	3
A4241 Harbour Way link between the A4241 Harbour Way / Main Gate Access Junction and the A4241 Harbour Way / A48 Margam Road / Access Road Junction	0	2	0	2
A4241 Harbour Way / A48 Margam Road / Access Road Junction	0	0	1	1
A48 Margam Road link between A4241 Harbour Way / A48 Margam Road / Access Road Junction and the M4 Junction 38	0	0	1	1
M4 Junction 38	1	2	6	9

Baseline Traffic Flows

- 5.130 In order to establish the existing traffic flow demand on the local highway network, manual classified turning count traffic flow surveys have been undertaken at all junctions in the study area. The traffic surveys were undertaken on Thursday 30th June 2022, in a neutral traffic month, between 07:00 – 09:30 and 16:00 – 18:30.
- 5.131 The resulting 2022 AADT Traffic Flows are shown in **Table 2.3.5** below for the links within the study area, with the link reference points presented in Figure 5.7 of the EIA Scoping Report (**Appendix 2.1**).
- 5.132 In addition, 2026 Baseline flows²² have also been determined in order to inform the potential for likely significant effects at the construction and operational stage. The predicated flows are, inclusive of background traffic growth and the following local committed developments²³:
- P2021/1255 - Land off J38 of the M4, Margam - Full planning application of the development of a metal processing facility totalling 28,500sq.m of floorspace comprising a powder processing plant (17,377sq.m), warehouse and store (5,428 sq.m) office building (1,442 sq.m), amenity building (776 sq.m), laboratory (200 sq.m),

²² The operational year of the Proposed Scheme is assumed to be 2026, as set out in **Volume 1, Chapter 4** of the ES.

²³ The identified committed developments have been determined in consultation with NPTCBC

services building (470 sq.m), substation (107 sq.m), phase 2 (2,700 sq.m), CCTV, storage tanks and plant, parking, servicing and roads and associated works; and

- A2020/0014 - Tyn-y-caeau, Margam Road - Change of use from dwelling house and annex building into a mixed used development consisting of guest house accommodation consisting of 16 guest rooms, with associated bar, cafe and spa facilities, and truck stop with 21 HGV parking spaces. The proposal includes the demolition of an existing single storey rear extension, and the erection of a single-storey rear extension, together with widened site access, additional internal access roads, parking areas and associated works.

Table 2.3.5: 2022 and 2026 Baseline AADT / Daily HGVs

Reference Point	Road Name	2022 AADT	2022 HGV	2026 AADT	2026 HGV
1	A48 Pentyla-Baglan Road	17954	698	18499	719
2	B4286 Heilbronn Way	17187	462	17712	476
3	Car Park Access (North)	15	0	15	0
4	A48 Heilbronn Way (North)	16991	698	17519	719
5	Car Park Access (South)	1155	354	1189	364
6	A48 Heilbronn Way (East)	10002	403	10305	415
7	Water Street	14420	585	14852	602
8	A4241 (North 1)	5490	231	5685	238
9	Industrial Unit Access (East)	438	74	452	76
10	Industrial Unit Access (West)	21	0	21	0
11	Harbourside Road	634	0	653	0
12	A4241 (North 2)	5362	251	5554	258
13	A4241 (West)	7775	310	8152	319
14	North Bank Road	732	113	754	116
15	A4241 Harbour Way (West)	12273	467	12815	481
16	Oakwood Road	762	20	785	20
17	Llewellyn's Road	949	88	977	91
18	A4241 Harbour Way (North)	11609	487	12131	501
19	West Gate Site Access	3072	260	3163	268
20	Access Road 1	49	10	51	10
21	A4241 Harbour Way (South 1)	10641	570	11134	587

Reference Point	Road Name	2022 AADT	2022 HGV	2026 AADT	2026 HGV
22	Access Road 2	152	0	157	0
23	Main Gate Site Access	4286	334	4414	344
24	A4241 Harbour Way (South 2)	9152	600	9601	618
25	Access Road 3	197	88	1584	111
26	A48 Margam Road (Norh)	7299	305	7989	347
27	A48 Margam Road (South)	14470	890	15759	1036
28	M4 Southbound Off-slip	3495	147	3947	185
29	A48 (East)	9230	378	9505	390
30	M4 Southbound On-slip	3406	334	3781	390
31	M4 Northbound Off-slip	4345	378	4711	430
32	Heolcae'r-Bont	772	103	795	106

Effects Unlikely / Not Significant

- 5.133 Based on the technical baseline and understanding of the Proposed Scheme (**Volume 1, Chapter 4** of the ES), the following effects are considered unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES. A factual evidence base has been provided below to support this.

Increase in driver delay as a result of temporary construction traffic

- 5.134 Professional judgement has been applied to consider how an increase in traffic flows arising from the construction of the Proposed Scheme would likely influence the junctions within the study area. In such circumstances and aligning with Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic²⁴ (referred to as 'IEMA Road Traffic Guidance'), it is considered that less than a 30% increase in flows would result in a 'negligible' increase in driver delay. Such judgement also aligns with Rule 1 of the screening procedure set out within IEMA Road Traffic Guidance, where it suggests that the scale and extent of any assessment of traffic related impacts should be where an increase by more than 30% should be considered²⁵.
- 5.135 The total estimated construction traffic flows (as informed by **Chapter 4** of the EIA Scoping Report and information provided by the Applicant/contractor) are shown in **Table 2.3.6** for the links within the study area as well as the percentage increase in traffic flows when compared to the 2026 AADT flows presented earlier. **Table 2.3.6** demonstrates that the construction (inclusive of demolition works associated with TCA East) in the most part would

²⁴ Institute of Environmental Management and Assessment (1993). Guidelines for the Environmental Assessment of Road Traffic.

²⁵ IEMA Guidance does make reference to a second rule where a 10% change should be considered within sensitive areas, however, the road links within the study area are not considered to be within a 'sensitive area'.

generate <5% change, with a single road (West Gate Site Access) seeing a higher increase (approximate 25.4%). As such, given that expected construction traffic is not considered to exceed a 30% change it would not give rise to a significant increase in driver delay during the construction stage.

Table 2.3.6: Estimated Construction Traffic Flows

Reference Point	Road Name	LGV	HGV	Total	% Increase over 2026 baseline
1	A48 Pentyla-Baglan Road	167	0	167	0.9%
2	B4286 Heilbronn Way	34	0	34	0.2%
3	Car Park Access (North)	0	0	0	0.0%
4	A48 Heilbronn Way (North)	202	0	202	1.2%
5	Car Park Access (South)	0	0	0	0.0%
6	A48 Heilbronn Way (East)	27	0	27	0.3%
7	Water Street	0	0	0	0.0%
8	A4241 (North 1)	229	0	229	4.0%
9	Industrial Unit Access (East)	0	0	0	0.0%
10	Industrial Unit Access (West)	0	0	0	0.0%
11	Harbourside Road	0	0	0	0.0%
12	A4241 (North 2)	229	0	229	4.1%
13	A4241 (West)	109	0	109	1.3%
14	North Bank Road	0	0	0	0.0%
15	A4241 Harbour Way (West)	338	0	338	2.6%
16	Oakwood Road	0	0	0	0.0%
17	Llewellyn's Road	0	0	0	0.0%
18	A4241 Harbour Way (North)	338	0	338	2.8%
19	West Gate Site Access	564	240	804	25.4%
20	Access Road 1	0	0	0	0.0%
21	A4241 Harbour Way (South 1)	226	240	466	4.2%
22	Access Road 2	0	0	0	0.0%
23	Main Gate Site Access	0	0	0	0.0%
24	A4241 Harbour Way (South 2)	226	240	466	4.9%
25	Access Road 3	0	0	0	0.0%

Reference Point	Road Name	LGV	HGV	Total	% Increase over 2026 baseline
26	A48 Margam Road (Norh)	21	37	58	0.7%
27	A48 Margam Road (South)	205	203	408	2.6%
28	M4 Southbound Off-slip	0	35	35	0.9%
29	A48 (East)	28	0	28	0.3%
30	M4 Southbound On-slip	89	83	172	4.6%
31	M4 Northbound Off-slip	89	85	174	3.7%
32	Heolcae'r-Bont	0	0	0	0.0%

- 5.136 Although no significant effects are expected, a Construction Traffic Management Plan (CTMP) will be prepared by the principal contractor which will set out the proposed routing of construction traffic and measures to enforce such routing (i.e. signage) [T3]. In addition, the CTMP will set out procedures for deliveries and any restrictions in line with best practice measures. The CTMP will be submitted as part of the CEMP for approval prior to any commencement on site [T3]. Therefore, such measures would further limit any potential for significant effects to occur.
- 5.137 Given the above, increase in driver delay as a result of temporary construction traffic is considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Delay in journey times of public transport as a result of temporary construction traffic

- 5.138 The local bus routes appear to avoid the majority of links within the study area, nonetheless, as detailed above, construction traffic associated with the Proposed Scheme is not considered to give rise to a significant increase in driver delay during the construction stage that it would influence public transport users and their journey time. Therefore, delays in the journey times of public transport as a result of temporary construction traffic is considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Changes to pedestrian amenity and delay as a result of temporary construction traffic

- 5.139 Amenity is defined in the Design Manual for Roads and Bridges (DMRB) as the relative pleasantness of a journey for pedestrians and others. This is mainly influenced by the volume and type of traffic on an adjacent link. Other key contributory factors are the standard and width of footways/cycleways, the street furniture provided, planting and landscape etc.
- 5.140 There is a shared footway / cycleway that runs along western side of the West Gate Access, connecting to a shared footway / cycleway on the A4241 Harbour Way via a dropped kerb crossing with tactile paving. The shared footway / cycleway on the A4241 Harbour Way provides a wide pedestrian connection to Margam and Port Talbot as well as to local bus

stops and Port Talbot Parkway Railway Station. During construction, no alteration will occur to existing footways and therefore, any changes to pedestrian amenity would arise from changes in traffic flows or composition.

- 5.141 As set out within IEMA Road Traffic Guidance, it is suggested that ‘significant’ changes to pedestrian amenity occur where traffic flow (or its lorry component) is either halved or doubled. As set out within **Table 2.3.6**, the proposed construction traffic flows (or lorry component) during the construction stage would not double or half of the existing baseline traffic flows. As such, the temporary construction traffic associated with the Proposed Scheme would not constitute a ‘significant’ change as defined by IEMA Road Traffic Guidance.
- 5.142 Nonetheless, a CTMP **[T3]** will be prepared by the principal contractor which will set out the proposed routing of construction traffic and measures to enforce such routing (i.e. signage). The CTMP will be submitted as part of the CEMP for approval prior to any commencement on site **[T3]**. Such measures would further support the minimisation of effects.
- 5.143 With respect to pedestrian delay, IEMA guidelines state that the volume, composition or speed of traffic may affect the ability of people to cross roads. The guidance proposes that evaluators “... use their judgement to determine whether pedestrian delay is a significant impact”.
- 5.144 There are multiple uncontrolled dropped kerb pedestrian crossings along the A4241 Harbour Way and uncontrolled pedestrian crossings are also present on at least one approach at the majority of junctions within the TA study area.
- 5.145 Pedestrian delay to cross a link is calculated using peak hour traffic flows on the relevant road link and Figure 1 of DMRB Volume 11 Section 3 Part 8²⁶. Applying this indicates that pedestrian delays to cross each of the roads on the pedestrian desire routes surrounding the Site would be less than 10 seconds in both the existing baseline scenario and during the construction stage with assumed construction traffic flows applied. As such, construction traffic is not considered to give rise to a significant increase in pedestrian delay during the construction stage.
- 5.146 Nonetheless, a CTMP **[T3]** will be prepared by the principle contractor which will set out the proposed routing of construction traffic and measures to enforce such routing (i.e. signage). The CTMP will be submitted as part of the CEMP for approval prior to any commencement on site **[T3]**. Therefore, such tertiary mitigation measures are considered an integral part of the Proposed Scheme.
- 5.147 Given the above, changes to pedestrian amenity and delay as a result of temporary construction traffic is considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Increase in fear and intimidation as a result of temporary construction traffic

- 5.148 As set out in IEMA Road Traffic Guidance fear and intimidation is dependent upon the amount of traffic, its HGV composition and its proximity to people or the lack of protection caused by narrow pavement widths, for example. The IEMA Road Traffic Guidance states that there are no widely acceptable thresholds for estimating this from known traffic and

²⁶ Design Manual for Roads and Bridges. Volume 11, Section 3, Part 8, Figure 1.

physical conditions, however, it does suggest some thresholds which could be used based on previous research and these are presented in **Table 2.3.7** below:

Table 2.3.7: Potential Thresholds for Assessing Impact on Fear and Intimidation

Degree of Hazard	Average traffic flow over 18hr day – (vehicles/hour 2-way)	Total 18 hour HGV flow	Average Vehicle Speed over 18 hour day (mph)
Extreme	+1,800	+ 3,000	+ 20
Great	1,200 – 1,800	2,000 – 3,000	15 – 20
Moderate	600 – 1,200	1,000 – 2,000	10 – 15

- 5.149 The above table identifies how a potential change in the degree of hazard can be used to determine the scale of impact of the Proposed Scheme upon the levels of fear and intimidation on the surrounding network.
- 5.150 The 2026 baseline AAWT flows and the 2026 ‘with scheme’ construction traffic AAWT flows are shown in **Table 2.3.8** below for the links within the study area. In addition, the 2026 baseline 18-hour HGV flows and the scheme construction traffic 18-hour HGV flows are presented in **Table 2.3.9**.

TableA2.3.8: 2026 Baseline AAWT / 2026 With Construction Traffic AAWT

Reference Point	Road Name	2026 AAWT	2026 AAWT (VPH)	2026 ‘With Scheme’ AAWT	2026 ‘With Scheme’ AAWT (VPH)
1	A48 Pentyla-Baglan Road	20158	1120	20283	1127
2	B4286 Heilbronn Way	19300	1072	19325	1074
3	Car Park Access (North)	17	1	17	1
4	A48 Heilbronn Way (North)	19090	1061	19241	1069
5	Car Park Access (South)	1296	72	1296	72
6	A48 Heilbronn Way (East)	11229	624	11250	625
7	Water Street	16184	899	16184	899
8	A4241 (North 1)	6195	344	6367	354
9	Industrial Unit Access (East)	492	27	492	27
10	Industrial Unit Access (West)	23	1	23	1
11	Harbourside Road	712	40	712	40
12	A4241 (North 2)	6052	336	6223	346

Reference Point	Road Name	2026 AAWT	2026 AAWT (VPH)	2026 'With Scheme' AAWT	2026 'With Scheme' AAWT (VPH)
13	A4241 (West)	8883	493	8965	498
14	North Bank Road	822	46	822	46
15	A4241 Harbour Way (West)	13964	776	14217	790
16	Oakwood Road	855	47	855	47
17	Llewellyn's Road	1065	59	1065	59
18	A4241 Harbour Way (North)	13219	734	13473	748
19	West Gate Site Access	3447	191	4050	225
20	Access Road 1	55	3	55	3
21	A4241 Harbour Way (South 1)	12133	674	12482	693
22	Access Road 2	171	10	171	10
23	Main Gate Site Access	4809	267	4809	267
24	A4241 Harbour Way (South 2)	10462	581	10811	601
25	Access Road 3	1726	96	1726	96
26	A48 Margam Road (Norh)	8705	484	8748	486
27	A48 Margam Road (South)	17172	954	17478	971
28	M4 Southbound Off-slip	4301	239	4327	240
29	A48 (East)	10357	575	10377	577
30	M4 Southbound On-slip	4120	229	4250	236
31	M4 Northbound Off-slip	5134	285	5264	292
32	Heolcae'r-Bont	866	48	866	48

Table 2.3.9: 2026 Total 18-Hour HGV Flow / Scheme Construction Traffic Total 18-Hour HGV Flow

Reference Point	Road Name	2026 18-Hour HGV	Scheme 18-Hour HGV Flow	Total
1	A48 Pentyla-Baglan Road	783	0	783

Reference Point	Road Name	2026 18-Hour HGV	Scheme 18-Hour HGV Flow	Total
2	B4286 Heilbronn Way	519	0	519
3	Car Park Access (North)	0	0	0
4	A48 Heilbronn Way (North)	783	0	783
5	Car Park Access (South)	397	0	397
6	A48 Heilbronn Way (East)	452	0	452
7	Water Street	656	0	656
8	A4241 (North 1)	259	0	259
9	Industrial Unit Access (East)	83	0	83
10	Industrial Unit Access (West)	0	0	0
11	Harbourside Road	0	0	0
12	A4241 (North 2)	281	0	281
13	A4241 (West)	348	0	348
14	North Bank Road	127	0	127
15	A4241 Harbour Way (West)	524	0	524
16	Oakwood Road	22	0	22
17	Llewellyn's Road	99	0	99
18	A4241 Harbour Way (North)	546	0	546
19	West Gate Site Access	292	180	472
20	Access Road 1	11	0	11
21	A4241 Harbour Way (South 1)	640	180	820
22	Access Road 2	0	0	0
23	Main Gate Site Access	375	0	375
24	A4241 Harbour Way (South 2)	673	180	853
25	Access Road 3	121	0	121
26	A48 Margam Road (North)	378	28	405
27	A48 Margam Road (South)	1129	153	1281
28	M4 Southbound Off-slip	202	26	228
29	A48 (East)	425	0	425
30	M4 Southbound On-slip	425	63	487
31	M4 Northbound Off-slip	469	64	532

Reference Point	Road Name	2026 18-Hour HGV	Scheme 18-Hour HGV Flow	Total
32	Heolcae'r-Bont	116	0	116

- 5.151 None of the links within the study area average over 1,200 vehicles per hour in either the base or with scheme construction traffic scenario and none of the links have 18-hour HGV flows of over 2,000. Therefore the degree of hazard would be less than moderate and would not increase as a result of the proposed construction phase.
- 5.152 Nonetheless, a CTMP [T3] will be prepared by the principle contractor which will set out the proposed routing of construction traffic and measures to enforce such routing (i.e. signage). The CTMP will be submitted as part of the CEMP for approval prior to any commencement on site [T3]. Therefore, such tertiary mitigation measures are considered an integral part of the Proposed Scheme.
- 5.153 Given the above, an increase in fear and intimidation as a result of temporary construction traffic is considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Increase in severance as a result of temporary construction traffic

- 5.154 The IEMA Road Traffic Guidance states that “severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery”. Furthermore, “Changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively”.
- 5.155 The IEMA Road Traffic Guidance acknowledges, however, that it is particularly difficult to predict and measure severance. Specific local conditions, in particular the location of pedestrian routes to key local facilities and whether or not crossing facilities are provided are key in the assessment of severance.
- 5.156 The Proposed Scheme during construction will not result in the creation of a new carriageway or road that would sever a community directly. Nor will the Proposed Scheme alter traffic speeds, widths of existing roads or remove any existing crossing facilities. As such, severance arising from such aspects is not anticipated. Therefore, any severance during construction would arise from changes to traffic flows increasing difficulty to cross roads.
- 5.157 There are multiple uncontrolled dropped kerb pedestrian crossings along the A4241 Harbour Way and uncontrolled pedestrian crossings are also present on at least one approach at the majority of junctions within the study area.
- 5.158 Uncontrolled crossings would be influenced by changes to traffic flows which could lead to increased difficulty in crossing and thus severance. Nonetheless, as set out within IEMA Road Traffic Guidance, a 30% change in traffic is considered to result in a ‘slight’ change in severance. As set out in **Table 2.3.6**, the construction traffic would generate a maximum of an approximate 25.4% increase (and in most case <5%) on any link within the study area when compared to the baseline 2026 AADT flows presented earlier. As such, increase in severance as a result of construction traffic is not considered to be significant.

- 5.159 Nonetheless, a CTMP [T3] will be prepared by the principal contractor which will set out the proposed routing of construction traffic and measures to enforce such routing (i.e. signage). The CTMP will be submitted as part of the CEMP for approval prior to any commencement on site [T3]. Therefore, such measures are considered to further reduce the potential of significant effects.
- 5.160 Given the above, overall increase in severance as a result of temporary construction traffic is considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Increase in accidents and safety as a result of temporary construction traffic

- 5.161 The IEMA Road Traffic Guidance states that “Professional judgement will be needed to assess the implications of local circumstances, or factors, which may elevate or lessen risks of accidents, e.g. junction conflicts”.
- 5.162 **Table 2.3.4** above shows no accidents were recorded at the A4241 / Industrial Unit Access / Harbourside Road / Industrial Unit Access (West) and A4241 Harbour Way / West Gate Access junctions during the five-year study period.
- 5.163 Of the remaining junctions within the study area, all experienced three or less accidents during the five-year study period except the M4 Junction 38. Less than three accidents over a five-year period is not considered to be an unusual frequency for these types of junctions and therefore, the existing accident record at these junctions does not represent a material concern in the context of the Proposed Scheme. Furthermore, all of the links experienced between 1 and 2 accidents over the five-year period, with no accident cluster spots.
- 5.164 A total of nine accidents were recorded at the M4 Junction 38 during the five-year period, of which, 6 resulted in ‘slight’ severity injuries, 2 resulted in ‘serious’ severity injuries and 1 resulted in ‘fatal’ injuries. The fatal accident took place in 2019 and involved a car moving off and a motorcycle colliding with the rear of the car. Whilst all accidents are regrettable, nine accidents over a five-year period (average of 1.8 per year) is not considered to be an unusual frequency for this type of junction and the traffic volumes it carries. Therefore, the existing accident record at this junction does not represent a material concern in the context of the scheme.
- 5.165 Therefore, it is considered that increased accidents and safety as a result of temporary construction traffic is unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES.

Increase in hazardous loads during construction stage

- 5.166 There are unlikely to be any hazardous loads as part of the construction stage and therefore, an increase in hazardous loads during the construction stage is considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Increase in driver delay; delays to journey times of public transport users; pedestrian amenity and delay; fear and intimidation; severance; and accidents and safety as a result of operational traffic

- 5.167 The Proposed Scheme does not result in any changes to highway infrastructure that would change traffic speeds or impact on pedestrians, cyclists or drivers. As such all potential effects at the operational stage would be derived from changes in traffic flows or

composition, in line with the IEMA Road Traffic Guidance. Furthermore, the operational stage will generate significantly less two-way traffic movements when compared to the construction stage, as summarised below:

- The applicant has confirmed the Proposed Scheme will generate up to 30 two-way tanker / HGV movements per day in relation to road imports / exports associated with the proposed Site operations. This is not significant for a 24-hour facility as even if it is assumed all imports / exports take place in the 12-hour period of 07:00 – 19:00, this results in just circa 3 additional two-way HGV movements per hour; and
- In terms of staff, there will be up to 84 staff spread across four shift patterns with a maximum of 168 two-way vehicle movements per day associated with staff.

5.168 Having regard to the above and when considering the evidence presented for the same effects during the construction stage (**Paragraph 5.133 – 5.164**) where there is expected to a greater level of traffic generated, all effects with the exception of hazardous loads, are considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

5.169 A Framework Operational Transportation Management Plan will be prepared and submitted within the Application. This will set out all forms of transportation to be used during the operation of the Proposed Scheme (and associated materials to be transported), including details of safety measures/procedures to be deployed to ensure safe transportation and compliance with any relevant legislation, regulation or guidance (i.e. UN Model Regulations, The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009, The International Convention for the Safety of Life at Sea, 1974 (SOLAS), The International Carriage of Dangerous Goods by Inland Navigation (ADN) and International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 relating thereto (MARPOL)) [**P6**].

Increase in hazardous loads during the operational stage

5.170 IEMA Road Traffic Guidance suggests that the ES needs to clearly outline the estimated quantity and composition of such loads, but that the analysis should reflect the nature of the load in question. The operational stage will result in hazardous loads such as sustainable diesel, nitrogen, contaminated water and waste ethanol being transported to/from the site via road.

5.171 Notwithstanding the above, less than 15 (30 two-way) hazardous loads are anticipated per day and all hazardous loads will be transported in appropriate vehicles, such as tankers, in accordance with the agreement concerning the International Carriage of Dangerous Goods by Road (ADR) / Regulation 5 of the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (CDG) [**T13**].

5.172 A Framework Operational Transportation Management Plan will be prepared and submitted within the Application. This will set out all forms of transportation to be used during the operation of the Proposed Scheme (and associated materials to be transported), including details of safety measures/procedures to be deployed to ensure safe transportation and compliance with any relevant legislation, regulation or guidance (i.e. UN Model Regulations, The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009, The International Convention for the Safety of Life at Sea, 1974 (SOLAS), The International Carriage of Dangerous Goods by Inland Navigation (ADN) and International

Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 relating thereto (MARPOL)) [P6].

- 5.173 Having regard to the above, hazardous loads during the operational stage are considered unlikely to be significant and will not be considered further within the EIA or reported in the ES.

Limitations and Assumptions

- 5.174 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessments of effects are based on projections based on various sources of information provided by the client on the anticipated operations and the construction traffic movements are based on professional experience and estimates provided by the contractor which may be subject to change as the scheme develops. This is considered the most appropriate and robust method for estimating the level of traffic anticipated to be generated, due to the bespoke nature of the Proposed Scheme; and
- The assessment year of 2026 is based on the projected construction programme.

Marine Navigation and Marine Recreational Resource

Technical Baseline

- 5.175 Port Talbot Docks is an existing and working docks, handling around 6.6 million tonnes of cargo every year and over £760 million of trade²⁷.
- 5.176 In addition, the Port Talbot Docks does support recreational uses, including fishing²⁸, sailing and rowing as part of the Port Talbot Sea Cadets (North Wharf), as well as other water sports through the Port Talbot YMCA Water sports facility (North Wharf). Afan Boat Club are located on the River Afan, near to Port Talbot Docks, with associated slipway and moorings.

Effects Unlikely / Not Significant

- 5.177 Based on the technical baseline and understanding of the Proposed Scheme (**Volume 1, Chapter 4** of the ES), the following effects are considered unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES. A factual evidence base has been provided below to support this.

Impacts on Marine Navigation (and safety) associated with additional ship movements

- 5.178 Ship movements associated with the Proposed Scheme will utilise the existing navigation line / routes to and from the port (as aided by existing navigation aids within Swansea Bay and Port Talbot Docks) as well as ensuring port entry requirements, as established by ABP as harbour master, are abided by. Such practices are commonplace for shipping movements akin to those to be adopted for the Proposed Scheme and already in place for all existing shipping movements to and from Port Talbot Docks. The Proposed Scheme will not therefore result in a need to deviate from this practice to result in a notable change to baseline conditions.
- 5.179 As such impacts on marine navigation (and safety) is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.
- 5.180 It should be noted that a Marine Navigation Risk Assessment will be submitted within the Application for completeness.

Impacts upon marine recreational resources associated with additional ship movements

- 5.181 The Proposed Scheme will result in the movement of additional ships, which could adversely influence the additional marine users, in terms of their ability to operate or use the Port Talbot Docks as per the baseline situation. Nonetheless, such users already have an interface with the existing ship movements and therefore already operate in such a way that their interaction with shipping movements are controlled and based on principles established by ABP as harbour master. The Proposed Scheme would not result in a deviation from this position or are so notable that they would remove the ability for such users to continue to operate. On this basis, impacts on marine recreational resources is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.
- 5.182 It should be noted that a Marine Navigation Risk Assessment will be submitted within the Application for completeness and will likely consider the interface between such other marine recreational uses and ship movements.

²⁷ <https://www.abports.co.uk/locations/port-talbot/>

²⁸ <https://fishingwales.net/fishing-locations/port-talbot-docks/>

Lighting

Technical Baseline

- 5.183 The Site comprises a mix of previously developed land and currently developed land within a wider industrial context. As such, there are no known operational lighting within the majority of the Site, with the exception of column lighting on Phoenix Way and lighting assumed to be present in TCA East. Nonetheless, in the wider area surrounding the Site there is existing lighting associated with the existing commercial/industrial operations and road network. The surrounding residential areas of Port Talbot are generally reflective of residential areas, where street lighting is the dominant lighting source, with façade mounted lighting associated with properties. Those properties with views towards the Site would likely experience the operational lighting associated with the wider commercial/industrial activities within Port Talbot.
- 5.184 Given the characteristics of the Sites it is likely to be classified as an E2/E3 (low/medium ambient brightness) lighting environmental zone²⁹ given the general absence of lighting and light spill into the Site from surrounding sources. Nonetheless, this would be in the context of the wider commercial/industrial surrounding which would be more characteristics of E3 (medium ambient brightness) up to an E4 (high ambient brightness) lighting environmental zone.

Effects Unlikely to be Significant

- 5.185 Based on the technical baseline and understanding of the Proposed Scheme (**Volume 1, Chapter 4 of the ES**), the following effects are considered unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES. A factual evidence base has been provided below to support this. Where mitigation has been used to inform this judgement, the identified mitigation has been captured within the Environmental Management Plan (EMP) provided in **Volume 3**.
- 5.186 Ecology receptors sensitive to lighting have been considered as part of the terrestrial ecology chapter (**Volume 1, Chapter 7: Terrestrial Ecology** of the ES).

Disturbance to nearby residents due to obtrusive light during construction

- 5.187 Light pollution (or obtrusive light) comprises any adverse effects of artificial lighting including glare³⁰, light trespass³¹/spill³² and sky glow³³, occurring as a result of temporary construction activities associated with the Proposed Scheme. The nature of the effect and its significance is relative to the existing baseline conditions (i.e. lighting environment experienced by

²⁹ NLIPI (2007). What are lighting environmental zones? Available at: <https://www.lrc.rpi.edu/programs/NLPIP/lightingAnswers/lightPollution/environmentalZones.asp> [Accessed 14/09/2022].

³⁰ The uncomfortable brightness of the light source against a dark background which results in dazzling the observer, which may cause nuisance to a specific receptor.

³¹ The spilling of light beyond the boundary of a property, which may cause nuisance to others.

³² The unwanted spillage of light onto adjacent areas which may affect sensitive receptors (particularly residential properties and ecological sites).

³³ The direct upward spill of light into the sky, which can cause a glowing effect and is often seen above cities when viewed from a dark area.

existing receptor) and general proximity to potential light sources, where the greatest effect is felt by receptors adjacent to, or in close proximity to a light source (i.e. within 50m).

- 5.188 The majority of the Site is not adjacent to residential receptors, with the PDZ (where the majority of temporary construction lighting will be implemented) being >400m from the nearest residential receptors at Lower West Road. It is noted that the closest any of the Site is to residential receptors is TCA1, which is approximately 50m from residential properties on Lower West End. However, these receptors do experience existing lighting environment governed by the highways lighting on Harbour Way A4241 (located between the receptors and TCA1). Furthermore, Harbour Way A4241 is located at a marginally higher elevation (approximately 10m AOD³⁴) than both TCA1 (approximately 8m AOD) and the residential properties on Lower West End (the closest being approximately 8m AOD), creating some degree of visual separation between the receptors and the likely temporary construction lighting, further separation is created by the closed board fencing barrier (assumed to be about 2m) located on the northern side of Harbour Way (likely deployed as noise mitigation for the road).
- 5.189 Lighting will be required during construction activities in order to provide a safe working environment, however, in the most part this lighting will be a notable distance from potential receptors (as noted above). Nonetheless, potential adverse effects arising from temporary construction lighting can be controlled through a series of best practice measures, in line with lighting industry standards and guidance including the CIE publication 'Technical Report Document 129'³⁵ and BS EN 12464-2:2014³⁶, incorporated as part of a CEMP **[T1, T5]**. The following measures are proposed in order to control Light Spill, Glare and Sky Glow effects and thus manage light pollution **[T5]**:
- Where practicable, construction lighting in the Site would be designed to comply with Environmental Zone E3 in accordance with the ILP Guidance Note GN01³⁷;
 - Illuminance levels arising from temporary lighting to be designed in accordance with BS EN 12464-2: 2014 and CIE 129.
 - Placement of temporary lighting required to ensure safe working conditions and to maintain security, to have due regard of sensitive receptors (i.e. occupied residential properties);
 - Lighting to be directed so as avoid unnecessary Light Spill outside of construction areas and to ensure that the light distribution is toward the task area;
 - Lighting to be switched off when not required for safe working conditions and Site security;
 - Use of light shields/baffles to control upward light to within the maximum 2.5% set out in the ILP Guidance Note GN01, where possible;
 - Lighting to be kept at 0° tilt to avoid Sky Glow, where practicable; and

³⁴ Informed by Google Earth elevation data

³⁵ CIE - Technical Report Document 129 (1998) Guide for Lighting Exterior Work Areas.

³⁶ British Standards (2014) BS EN 12464-2 – Lighting of Work Places – Part 2: Outdoor Work Places.

³⁷ Institute of Lighting Professionals (ILP) (2021) Guidance Notes for the Reduction of Obtrusive Light (GN01).

- Light dimming and automatic switch off would be used (where appropriate).

5.190 Therefore, disturbance to nearby residents due to obtrusive light during construction is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Disturbance to residents due to obtrusive light during operation

5.191 Operational lighting will be required for the Proposed Scheme to ensure appropriate working environment and according with Health and Safety guidance. The exact future lighting is not known at this time, but is likely to include a combination of the following:

- Operational task lighting associated with operational plant and machinery, including at height (i.e. gangways, instrument panels, inspection/monitoring locations etc.);
- General task lighting between operational plant/machinery to provide safe working conditions;
- Column lighting associated with internal access roads/points;
- Low level bollard lighting associated with pedestrian routes/zones;
- Façade mounted general/security lighting (i.e. flood lighting) in and around ancillary operational facilities (i.e. plant room, laboratories etc.) and ship/road loading facilities; and
- Reinstated highways lighting on Phoenix Way and provision of additional similar lighting at new access points.

5.192 As noted within **Volume 1, Chapter 4** of the ES, the Proposed Scheme requires the installation of a single enclosed ground flare. The flare is provided for essential operational safety purposes or the ‘venting/clearing’ of material during ‘start-up’ and ‘shut-down’ stages, which would largely occur when catalytic material in the process is to be renewed (approximately every 2 years) and for other maintenance activities. The flare will have a continuous pilot flame. Nonetheless, the use of a ground flare means that any ‘lighting’ impacts that may arise from it is limited due to intervisibility between the Site and receptors and general containment within the Site (i.e. the barrier that surrounds the flare) and screening effect provided by surrounding plant/equipment. Overall, it is considered that the ground flare would be noted in the context of the other operational lighting associated with the Proposed Scheme, but its contribution to potential nuisance issues minimal.

5.193 Almost all operational lighting, including that associated with the flare, will be located within the PDZ. The only element of lighting outside of the PDZ will be associated with ship unloading/loading facility. Nonetheless, lighting associated with the jetty is considered to be minimal and comprise focused task lighting.

5.194 As with the discussion of effects for temporary construction lighting (**5.186 – 5.189**) the nature of effect(s) and its significance is relative to the existing baseline conditions (i.e. lighting environment experienced by existing receptor) and general proximity to potential light sources. As already established (**Paragraph 5.187**) potential receptors are all located >400m from the PDZ. At such distances the potential for nuisance effects is considered unlikely and not significant, even where operational lighting will be visible in the distance (i.e. lighting at height). Furthermore, the operational lighting associated with the Proposed

Scheme is not considered to influence the existing lighting environment experienced by the receptors, which is dominated by the existing street lighting located in proximity to the receptors.

- 5.195 Obtrusive light can be avoided through appropriate lighting design in line with best practice, guidance and standards, including but not limited to: ILP's PLG04³⁸; ILP Guidance Note GN01³⁹; British Standard 5489-1:2020⁴⁰; BS EN 13201-2 – Road lighting⁴¹, and BS EN 12464-2 – Lighting of Work Places⁴² **[P4]**. Measures to mitigate effects from obtrusive light, as set out in the identified guidance, include the selection of the correct type of luminaire, the use of shields, hoods (as required), as well as the design and positioning of lights (e.g. power, orientation, and height of the luminaire) **[P4]**.
- 5.196 Overall, when considering the existing factors, distances to receptors and the provision of a correctly design lighting scheme at the Site, disturbance to residents due to obtrusive light during operation are considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

³⁸ Institute of Lighting Professionals (ILP) PLG04 Guidance on Undertaking Environmental Lighting Impact Assessment (2013)

³⁹ ILP Guidance Note 01/21 The Reduction of Obtrusive Light (2021)

⁴⁰ British Standard (2020). 5489-1:2020 Design of road lighting. Lighting of roads and public amenity areas. Code of practice.

⁴¹ BS EN 13201-2:2015 Road Lighting Performance Requirements (2016)

⁴² BS EN 12464-2:2014 Light and Lighting – lighting of work places. Outdoor work Places (2014)

Waste

Technical Baseline

- 5.197 The Site is largely vacant, and so generally there is no existing waste generating uses on Site. The exception to this is TCA East where there are existing uses that will likely generate some level of waste, some of which will be industrial and commercial waste, and may include hazardous waste.

Effects Unlikely to be Significant

- 5.198 Based on the technical baseline and understanding of the Proposed Scheme (**Volume 1, Chapter 4** of the ES), the following effects are considered unlikely to be significant and therefore will not be considered further within the EIA or reported in the ES. A factual evidence base has been provided below to support this. Where mitigation has been used to inform this judgement, the identified mitigation has been captured within the Environmental Management Plan (EMP) provided in **Volume 3**.

Waste generation during construction

- 5.199 Sources of waste during the construction stage, including that arising from the demolition of the buildings/structures within TCA East are assumed to relate to construction materials (including packaging) and general construction activities⁴³ and demolition waste arising from TCA East.
- 5.200 At TCA East, it is estimated that there are 4,529m² of buildings/structures to be demolished (assuming all buildings are single storey or equivalent). Based on a standard working calculation which takes the assumed building/structure area and multiplies this by 0.3 to estimate the likely demolition waste, the clearance of TCA East is expected to give rise to approximately 1,358.7m³ of waste arisings. This value does not account for any form of recycling or reuse of waste and therefore represent a reasonable worst case. Furthermore, as specified in **Volume 1, Chapter 4** of the ES it is assumed that where achievable hard core from the demolition will be crushed on-site and reused at a later date, thereby reducing potential waste arisings from the demolition works within TCA East. It is expected that some of the on-site buildings/structures within TCA East contain hazardous substances⁴⁴, including asbestos⁴⁵, which will require specialist removal. All such works will be undertaken by an appointed contractor and disposed of by the contractor in line with relevant regulations and legislation requirements.
- 5.201 It is anticipated that generic waste produced during construction would be controlled through the implementation of a CEMP, secured by planning condition. The CEMP will be informed by the waste provisions of the Environmental Protection Act 1990⁴⁶ and the Environmental Protection (Duty of Care) Regulations 1991⁴⁷ **[T1]** and will set out the

⁴³ There is an assumed cut and fill balance across the Site, as set out within **Volume 1, Chapter 4** of the ES.

⁴⁴ The Hazardous Waste (England and Wales) Regulations 2005, No. 894.

⁴⁵ The Control of Asbestos Regulations 2012, No. 632.

⁴⁶ Environmental Protection Act 1990 No. 43 Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> [Accessed: 22/12/2022].

⁴⁷ Environmental Protection (Duty of Care) Regulations 1991 No. 2839. Available at: <https://www.legislation.gov.uk/uksi/1991/2839/made#:~:text=The%20duty%20requires%20such%20persons,person%20or%20to%20a%20person> [Accessed: 22/03/2022].

principles and legal requirements relating to waste, including any hazardous waste that is encountered and required to be exported off-site for disposal.

- 5.202 The CEMP will also describe how materials will be managed efficiently and disposed of legally during construction. It will also outline the aims, objectives and on-going management responsibilities, including management practices, to be implemented during the construction stage, and will set targets for the reduction, diversion from landfill and reuse of waste **[T7]**.
- 5.203 Therefore, waste generated during construction is considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

Waste generated during operation

- 5.204 Waste generated during the operational stage is anticipated to include generic waste streams arising from the ancillary infrastructure on Site (i.e. control room, laboratories etc.) as well as secondary outputs of the overall ATJ SPK and ATJ-RD production process, as set out in **Volume 1, Chapter 4** of the ES (i.e. waste ethanol and impurities and spent catalyst). In the most part the production process is largely a closed system and therefore there is limited waste streams, however, there will be inevitable waste products.
- 5.205 The secondary output from the process are very specific materials and therefore requires specific management and disposal processes, rather than being disposed of to landfill. In some instances, these waste arising would be classified as hazardous substances and therefore will be managed and disposed in line with the Hazardous Waste (England and Wales) Regulations 2005⁴⁸. Other substances, such as the process catalyst, are dealt with through the supplier who will remove waste product either for re-use or appropriate disposal. An operational management practice will be in place for the waste arising from the industrial process.
- 5.206 With respect to the generic waste arisings statutory legislation (i.e. The Waste (England and Wales) Regulations 2011, Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) Regulations 1991) defined that it is the responsibility of the occupants to arrange for the necessary refuse and recycling to be collected from their premises. As such, the Applicant will employ a suitably accredited waste contractor to collect the waste arising from the Site **[P5]**. Waste collection frequency will be dependent upon the volume of waste generated, the storage method (i.e. whether balers and waste compactors are used) and the schedule of the appointed waste contractor. Nevertheless, the Proposed Scheme will include the appropriate provision for waste storage and handling facilities/areas, inclusive of areas for segregation of waste and recycling in accordance with British Standard (BS) 5906:2005 Waste Management in Building – Code of Practice **[P5]**.
- 5.207 Based on the evidence above, specifically adherence to relevant legislation and regulations, effects related to operational waste are considered unlikely to be significant and will not be considered further in the EIA or reported in the ES.

⁴⁸ Hazardous Waste (England and Wales) Regulations 2005 no. 894.