



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David



Lywodraeth Cymru
Welsh Government

Variation of condition application relating to outline planning
permission 2008/0996 (granted 11th October 2010) at SA1
Swansea Waterfront Innovation Quarter

Environmental Statement Addendum

Prepared/ Collated for University of Wales Trinity Saint David and the Welsh Government
by Stride Treglown Limited
July 2015

Contents

1.	Non-Technical Summary.....	1.1 - 21
2.	Introduction	2.1 - 16
3.	Planning Context	3.1 - 5
4.	Geology and Contamination Assessment.....	4.1 - 20
5.	Hydrology and Drainage	5.1 – 10
6.	Traffic, Highways and Access	6.1 - 18
7.	Air Quality.....	7.1 - 21
8.	Noise	8.1 - 20
9.	Ecology.....	9.1 - 14
10.	Landscape and Visual Assessment.....	10.1 - 23
11.	Archaeology	11.1 - 14
12.	Waste and Recycling	12.1 - 7
13.	Infrastructure and Services	13.1 - 3
14.	Socio-Economic.....	14.1 - 32
15.	Summary Effects Table	15.1 – 5
16.	Conclusions	16.1 - 2

Note:

Please note that this Environmental Statement Addendum should be read in conjunction with an accompanying Technical Appendix submission, submitted under separate cover. The numbering of the Appendices corresponds with the Chapter numbering within this statement.

1. Non-Technical Summary

1.1. Introduction

- 1.1.1 This Environmental Statement Addendum (ESA) has been prepared and is submitted as part of the suite of documents forming a variation of condition application to facilitate the implementation of a revised set of masterplan proposals across the SA1 Waterfront Innovation Quarter area of Swansea. The variation of condition application is made in the joint names of the Welsh Government, the original applicant in 2002 and again in 2008, and the University of Wales Trinity Saint David (“UWTSD”).
- 1.1.2 The masterplan revisions seek to replace part of the approved (2010) masterplan underpinning outline planning permission 2008/0996, granted on the 11th October 2010. The variation of condition application seeks to vary planning conditions relating to the site masterplan, development capacities and those that included references to the original 2002 and the 2010 Addendum Environmental Statement (AES). The conditions included with any new decision notice, should planning permission be granted, shall relate only to the development plots controlled by the UWTSD and shall not apply to land retained by the Welsh Government or third parties.
- 1.1.3 This ESA has been prepared with the support of a multi-disciplinary team of specialist consultants and collated by Stride Treglown Ltd on behalf of UWTSD.

1.2. Site Description

- 1.2.1 The wider SA1 site lies to the south of the main shopping areas and civic hub of the city and to the immediate east of the Maritime Quarter – the first area of the docklands to undergo regeneration. The new Swansea University Bay Campus (under-construction) lies to the east on a former BP site. The proposed Tidal Lagoon (tidal power station and recreational project) also lies to the south east of the site. The current active trading Port of Swansea is now concentrated on the Kings Dock and Queens Dock (to the south of the Prince of Wales Dock) where there are extensive cargo facilities.
- 1.2.2 The sites secured by UWTSD for regeneration purposes are located across the area now known as the “SA1 Waterfront Innovation Quarter” on former docklands, close to and to the east of, the City Centre. This area lies within the central part of Swansea Bay, on the east side of the River Tawe where it joins the Bay. The Bay stretches from the Mumbles and the Gower Peninsula in the west to Port Talbot and Porthcawl in the east.
- 1.2.3 The site is generally flat and lies between 6 and 7 metres Above Ordnance Datum (AOD). In the wider context, the highest local point is Kilvey Hill to the north of the site at 190m. These hills form a backdrop to the site when looking north and northeast.

1.3. Variation of Condition Application (Description of Development)

- 1.3.1 A Section 73 application provides an opportunity for conditions imposed on a previous planning permission to be revised or removed. The Local Planning Authority also has the opportunity of adding new conditions and the result of a successful application is a fresh planning permission.
- 1.3.2 The focus of the variation of condition application are conditions 2 and 5 which refer to the previous masterplan and development capacities table. It is therefore proposed to:
- (1) Revise or remove other conditions that have been successfully discharged and no longer apply (in which case the application seeks their removal)
 - (2) Review conditions which remain valid in principle and require updating with reference to policy, guidance or standards which have come into effect since the granting of planning permission in October 2010 and;
 - (3) Update certain conditions to refer to the revised masterplan, Design Code, Design & Access Statement and 2015 Environmental Statement Addendum.
 - (4) Elsewhere the application seeks to rationalise retained conditions to create a more succinct permission.
- 1.3.3 The principal use of the buildings proposed for development fall within the following uses classes as set out in the Town and Country Planning (Use Classes) Order 1987 (as amended):
- (1) University (academic) accommodation – Use Class D1
 - (2) Commercial Offices, Research and Development and Light Industrial – Use Class B1 (a), (b) and (c).
 - (3) Residential accommodation – Use Class C3
 - (4) Retail / Professional Service uses – Use Classes A1 and A2
 - (5) Restaurants, Cafes, licensed and takeaway premises– Uses Classes A3, A4 and A5.
 - (6) Sports and Recreation uses (associated with University activities)
 - (7) Galleries and exhibition spaces
- 1.3.4 New buildings will be complemented by a series of connected vehicular and landscaped pedestrian routes and public spaces.
- 1.3.5 The masterplan also makes provision for a canal reservation corridor which has the potential to facilitate a direct water connection between the western end of the Prince of Wales Dock and the River Tawe. This accords with the previous 2003 and 2010 SA1 outline planning permissions and a long-standing planning policy position set out by the City and County of Swansea as Supplementary Planning Guidance. The delivery of a canal connection would be the subject of a separate detailed planning application, supported by appropriate technical assessments.

1.4. The Need for the Project

- 1.4.1 The University of Wales Trinity Saint David (UWTSD) has both taught degree and research degree awarding powers and has been formed following several mergers - the merger of Trinity University College (established in 1848), the University of Wales, Lampeter (established by Royal Charter in 1828) and in 2013 with the former Swansea Metropolitan University.
- 1.4.2 The main curriculum areas include arts, education and humanities (currently located at the Lampeter and Carmarthen campuses) and applied design and engineering, art and design, business and management, humanities and education (currently located in Swansea).
- 1.4.3 The new University is committed to the development of a culture of learning that:
- Promotes regional economic regeneration through the provision of relevant education, vocational training, and the ability to support continuing professional development;
 - Focuses on the individual learner, remains rooted in local communities, is inclusive, and provides an environment capable of transforming lives; and
 - Complements the academic and research portfolio of Swansea University, especially that envisaged from the new second Science & Innovation Campus in Neath Port Talbot.
- 1.4.4 The redevelopment and regeneration of SA1 will make provision for the University to develop an international centre of excellence in the design and development of new products and services to drive creativity, innovation and knowledge transfer across a spectrum of disciplines. It is seen as an opportunity to deliver a positive and lasting impact across a wide range of sectors, consistent with the Welsh Government's sector priorities, and the City and County of Swansea's emerging regeneration plans.
- 1.4.5 The University intends to create an intellectual and technological resource which would provide a 'life support' system for new ideas - outward-facing, supporting regional, national and international companies and entrepreneurs. This approach will support innovation and entrepreneurship among staff and students of the University.
- 1.4.6 The University is keen to act as a catalyst, or engine for growth and prosperity across the region, with its activities at SA1 attracting inward investment and collaboration with commercial, enterprise and creative industry partners.
- 1.4.7 Uniquely, because of the geographical and discipline breadth in the University, UWTSD continues to operate across a wide spectrum of the knowledge economy, supporting the identification and capture of new ideas in areas such as design and automotive engineering, as well as in domains traditionally at the periphery of innovation initiatives, such as archaeology, the creative arts and a range of craft disciplines.
- 1.4.8 The focus for immediate development will be in Swansea SA1. The existing higher education activities on the Townhill, Mount Pleasant, and Ty Bryn Glas campuses will be ultimately relocated to two primary locations:
- 1) The Cultural Quarter, in the heart of the City (The Alexandra Road Art & Design Campus, incorporating the Alex Design Exchange and Dynevor Art & Design Centre)
 - 2) A new Waterfront Innovation Quarter, around the Prince of Wales Dock in Swansea SA1.

- 1.4.9 The transformed SA1 will become the gateway between the region's two universities and the city, creating new opportunities for joint university enterprises in complementary discipline areas.
- 1.4.10 The revised masterplan sets out an important aspect of a university-wide transformation project that will embrace all elements of the UWTSD experience – looking at how the curriculum should be delivered in the future and what spaces and buildings will best support these activities. Faculties for all campuses will be working together to define the University's future learning landscape.
- 1.4.11 Further information relating to the University's accommodation needs and the underlying initiatives helping to shape these needs is presented in Section 3.4 of the Planning Design and Access Statement, submitted under separate cover.
- 1.4.12 The Swansea Waterfront Innovation Quarter continues the University's tradition of evolution to better meet the educational needs of the region. As the curriculum develops over time, and the learning and teaching approach changes to embrace Information Technology and changing student expectations, it is imperative that the University's physical estate – its buildings and its surroundings area – supports rather than constrains the learning the research activities of the University.

1.5. Partnership Working

- 1.5.1 The University is working in partnership with the Welsh Government to facilitate and deliver a coherent mixed use development strategy at the SA1 Waterfront Innovation Quarter. This partnership will further define Swansea as an Innovation City through establishing a range of impact hubs in identified priority areas to deliver clear economic and commercial benefits and creating a critical mass of expertise that can attract new companies, partnerships and investment.
- 1.5.2 The partnership will also build an integrated innovation and enterprise system that will facilitate the transfer of knowledge and collaboration between industry and academia. It will bring worldwide best practice to Wales to link with or complement the best of Welsh creativity and innovation, thereby playing a major role in the regeneration of the City and the Region.
- 1.5.3 In addition, the partnership will assist UWTSD to fulfil its core mission of improving access to higher education and skills development. This objective is relevant to local communities and employers and enhances the employability of its graduates. UWTSD wishes to ensure that the Higher Education it provides fulfils its potential in contributing to, and otherwise securing economic regeneration in the Swansea Bay Region.

1.6. Environmental Effects

- 1.6.1 The ESA outlines the likely environmental effects generated by the masterplan and which underpins the variation of condition application. The main effects are summarised below. Construction effects would be controlled through the implementation of a Project by Project Construction Environmental Management Plan (CEMP), which would include measures to control effects in relation to access and traffic movement, noise and vibration, air quality (including dust), contamination (as may be required), waste management, water resources, landscape and ecological/nature conservation interests.
- 1.6.2 The impacts to be assessed within the ESA have been agreed with the City and County of Swansea, as the Local Planning Authority, and set out within their EIA Screening Opinion response issued on the 25th February 2015.

1.7. Solis, Geology and Contamination

- 1.7.1 The subject site lies on an area of reclaimed land which was part of the former Swansea Docks. From a review of historical maps the site has previously been occupied by Tin Plate Works, Copper Works, Coal Wharves, railway sidings, a tidal basin / lock and later by depots / warehousing. In recent years the site has mainly been void of buildings.
- 1.7.2 The geology of the site and surrounding area comprises Middle Coal Measure strata, with superficial deposits indicated as Blown Sand or Marine Beach Deposits. Investigations have taken place and encountered conditions consistent with above, however Made Ground (granular fill of ash, clinker and slag) is present across the majority of the site to depths ranging between 3.4m and 9.7m in the area of the dry dock. The Coal Authority indicates that the site is not within a past or present zone of physical influence from surface or underground coal workings.
- 1.7.3 The bedrock beneath the site is classified as a Secondary A aquifer and the site does not lie within a Source Protection Zone.
- 1.7.4 Previous intrusive ground investigations found organic and inorganic compounds to exceed guideline values for a residential end use in the eastern area of the subject site. Gas monitoring indicated low concentrations of methane and carbon dioxide. Mitigation measures are proposed that provide for an appropriate separation layer to enable residential development to be brought forward in this area.
- 1.7.5 Based on the information gathered, the potential effects on identified receptors without mitigation measures being adopted are considered to be moderate. Proposed mitigation measures include adoption of appropriate health and safety, best practice during the site works to protect the receptors (construction workers / on-site residents / groundwater) and further investigation to understand the current land quality status of the site. Appropriate remediation will be undertaken to make the site suitable for use. The residual effects after mitigation measures are assessed as 'not significant'.

1.8. Hydrology and Drainage

- 1.8.1 Other than the infill development of the identified plots and partial completion of the proposed drainage and highway network, the background hydrology of the Revised SA1 Masterplan site has not materially changed since the 2002 Wardell Armstrong Environmental Statement, the 2006 Flood Consequences Assessment (FCA) and the 2010 Addendum Environmental Statement.
- 1.8.2 The areas within 2015 Revised SA1 Masterplan, and which are proposed for the new, mixed use, SA1 Waterfront Innovation Quarter development are former Swansea Port land and are generally levelled and prepared with hardcore or made ground to accommodate future development.
- 1.8.3 The masterplan includes revisions to development plots to the west of the Peninsula, located between the Kings Dock to the south and the Prince of Wales Dock to the north. The Peninsular site is located with the River Tawe and Swansea Marina to the west. The River Tawe is impounded by a control barrage which incorporates a vessel and fish pass.
- 1.8.4 To the east of the SA1 Peninsular a tidal basin has been constructed as part of the overall SA1 development. There are proposals for this to form a potential future link to the Prince of Wales dock. The Prince of Wales dock is currently part of the Associated British Ports (ABP) operational docks.

- 1.8.5 Environment Agency (National Resources Wales NRW) have previously commented that a minimum development floor level of 6.58m AOD should be adopted. The tidal and fluvial conditions and risks have not changed since the time of the Environment Agency (NRW) comments.
- 1.8.6 The Mean High Water Spring tidal flood levels from Admiralty Tide Tables is +4.5m OD and the Highest Astronomical Tide is +5.4m. The water level in the Prince of Wales dock is controlled by ABP and has an average level of 4.75m AOD although the highest impounded water level is 5.21m AOD. The assessed T200 (a once in 200 year flood) event, including allowance from climate change, is 6.58m AOD.
- 1.8.7 The extreme event flood level for T1000 year return period (a once in a millennium flood event) has been previously assessed as 6.83 AOD and this level remains valid for the development. Including 0.25m freeboard, the minimum recommended floor level for the development is 6.83m AOD although levels of 7.00 m AOD and higher would provide a greater resilience to extreme events.
- 1.8.8 Any areas in the proposed development with floor levels below 6.83 level would need to be raised above this level. Both the Peninsular site and Plots E-F have general ground levels above the T200 level and in places are above the T1000 level. Therefore the site can be developed without introducing a flood risk for floor levels of 6.83m minimum and an optimum of 7.10m AOD to cater for extreme events.
- 1.8.9 Basement or under-croft parking would be susceptible to flooding for levels below 6.58m AOD and suitable non-habitable uses with pumping facilities would be necessary. Where possible access roads to under-croft parking should have an optimum level 7.10m to prevent the likelihood of flooding in extreme events.
- 1.8.10 The potential development of Swansea Bay Tidal Lagoon will have a neutral or marginally beneficial effect on the proposed SA1 development. The lagoon proposals will introduce an increased resilience to surge tides from the Severn Estuary flooding the Kings Dock, which is adjacent to the SA1 development.

Flood Consequences for development

- 1.8.11 Although the existing SA1 Waterfront site does not have any flood defences against tidal flooding, the existing ground levels of the proposed development area for the SA1 development are above the assessed T200 plus climate change level of 6.58m.
- 1.8.12 The site is accessed via Kings Road to the west and Marine Road/Langdon Road to the east and these roads satisfy the minimum requirements for flood evacuation routes being above the T200 flood level and no less than 0.3m below the T1000 flood level. Any basements or under-croft car parking would need to be designated for suitable uses in view of the flood risk with appropriate drainage facilities provided.

Surface Water Drainage

- 1.8.13 The surface water drainage strategy for the existing SA1 development comprises separate highway and plot drainage systems with outfalls into the Prince of Wales Dock. Plots bounding the River Tawe also discharge directly to it via dedicated plot drainage systems.
- 1.8.14 The existing drainage infrastructure would be utilised to serve the Revised SA1 Masterplan. The drainage network would be supplemented by new piped connections and outfalls to provide an adequate surface water drainage system for the development.

- 1.8.15 Due to the made ground and potential risk from contamination, infiltration drainage Sustainable Urban Drainage Systems are not suitable and separation of surface water from paved areas or roofs from groundwater would be necessary. See also 1.8.19 below.
- 1.8.16 Surface water flows would be discharged directly from the site to the Prince of Wales dock or the River Tawe and would not require attenuation. However, outfall levels would ideally need to be positioned above high tide levels in the Tawe and high water levels in the Prince of Wales dock to prevent a “tide locking” scenario. In the event that lower outlet levels are necessary, adequate storage capacity could be built into the system through tanks or oversized pipes. This will be determined at detailed design stage.

Water Quality

- 1.8.17 Suitable oil separators are required to intercept flows from trafficked areas within the plots to ensure good water quality in the discharged surface water. Drainage from roof areas would also be kept separate as far as is practicable and would not require treatment through oil separators.
- 1.8.18 Ground conditions are generally unsuitable for infiltration drainage and through separation of surface water flows from groundwater this would provide some improvement in overall water quality compared to the existing conditions. Suitable SuDS features could be incorporated into the soft landscape features but these would need to be separated from ground water with a liner to prevent infiltration and leaching of existing contaminants.
- 1.8.19 The proposed development will provide an impermeable barrier of tarmac/concrete over the vast majority of the site, which at present has areas where run-off can permeate into the ground leaching the existing contaminants into the water table. The capping of the site with an impermeable layer will prevent this leachate occurring and improve water quality by reducing the amount of leachate flowing into the water table.

Foul Water Drainage

- 1.8.20 The foul drainage strategy comprises of piped gravity system within Kings Road and Marina Road / Langdon Road with spurs from each development plot. The existing foul network discharges to drop shafts on the existing Dwr Cymru Welsh Water (DCWW) deep sewer which lies below Langdon Road that connects to Swansea Waste Water Treatment Works (WWTW) to the east.
- 1.8.21 The existing SA1 development has Water Industry S.106 discharge consents in place and, together with the adoptable foul drainage network, it is intended to provide for fully serviced development plots.
- 1.8.22 Due to site levels and drained lengths, the gravity sewer serving those plots at the south end of Kings Road (including the peninsula site) include a pumping station and associated storage tanks.
- 1.8.23 An assessment of the foul flow has been prepared based on the population of the Revised SA1 Masterplan and estimated capacity of the existing infrastructure. A new piped drainage network would be required to serve the peninsula site but no improvement works would be required to the existing as-built foul drainage system in Kings Road and Marina Road / Langdon Road as a result of these amendments.

- 1.8.24 The proposed sports facility to the east of the peninsula site would connect to the gravity foul sewer in Marina Road. Due to the shallow depth of the sewer in Marina Road this will be achieved by the use of a sewage pumping station which will remain private. This will serve only one property and would not be considered for adoption by DCWW unless another development connected to the sewage pumping station.
- 1.8.25 The residential developments on Plot E would be able to connect to the gravity foul sewer in Marina Road without the requirement for a sewage pumping station.
- 1.8.26 Using the Revised SA1 Masterplan floor areas, foul discharge calculations have been produced using the DCWW Sewerage Design Manual v2.1. The calculations show a peak foul discharge rate within the existing foul sewer network threshold capacity and storage without the need for any major alterations (compared with the previously submitted 2010 Environmental Statement Addendum)
- 1.8.27 The surface water and foul water drainage strategy for the Revised SA1 Masterplan follows the previous strategy from the 2010 AES and will have no major impact on the drainage network for the revised SA1 Masterplan development.

1.9. Traffic, Highways and Access

- 1.9.1 The transport chapter of the ESA considers the existing transport and access conditions in the vicinity of the variation of condition application site and potential likely significant environmental effects of the SA1 2015 Masterplan compared to that consented in the 2010 Masterplan.
- 1.9.2 Traffic and accident data has been obtained from City and County of Swansea for the baseline situation and the transport assessment for the 2010 Masterplan has provided forecasts of future traffic generation for the consented development. The methodology for traffic generation forecasts for the 2015 Masterplan has been agreed with the local highway authority.
- 1.9.3 The environmental impacts of traffic can be on pedestrian amenity and delay, severance, driver delay and accidents and safety. The significance of effects is dependent on the sensitivity of receptors (defined in terms of proximity to residential properties, schools and public spaces, accident blackspots and congested routes for example) together with the magnitude, duration and reversibility of the effects in the context of the highway characteristics.
- 1.9.4 The analysis demonstrates that for average daily traffic (AADT), the 2015 Masterplan is anticipated to generate less traffic than the 2010 consented Masterplan, thus having a beneficial impact.
- 1.9.5 Further analysis has been undertaken of the traffic changes in the AM and PM peak hours, recognising that these are sensitive time periods in terms of congestion and its impacts in the Fabian Way corridor. During these peak hours, the increase in traffic on the highway links assessed compared to the 2010 consent is in all cases less than the thresholds set out in the Institute of Environmental Management and Assessment guidelines (10% on sensitive routes and 30% on routes of low environmental sensitivity). As such the environmental effects are assessed as negligible and Not Significant.
- 1.9.6 Whilst the impacts are not significant, mitigation is proposed to encourage sustainable modes of travel and minimise traffic impacts as good practice and to address the impacts on the capacity of the local junctions. This is considered in the accompanying Transport Assessment.

1.10. Air Quality

- 1.10.1 The assessment of air quality impacts associated with the development was updated having regard to changes in baseline pollution levels and potential variations in traffic flows in the area as a result of the proposals when compared to the 2010 consented scheme.
- 1.10.2 Baseline air quality conditions in the vicinity of the application site were defined and found to be generally good. However, recent monitoring results have indicated exceedences of the relevant air quality objective at properties fronting Fabian Way. As such, impacts associated with exhaust emissions from vehicles travelling to and from the development along Fabian Way were identified as being of particular concern.
- 1.10.3 A number of other sensitive locations were identified, including existing and proposed residential properties and an ecological designation. These positions were utilised in the assessment of potential air quality effects.
- 1.10.4 The assessment of potential air quality impacts associated with road vehicle exhaust emissions was revised using dispersion modelling. The results indicated that predicted effects would be negligible at all sensitive locations, including both residential properties and the nearby ecological designation, when compared with the 2010 consented development.
- 1.10.5 Although not considered within the ESA, potential effects associated with fugitive dust emissions during the construction phase were also considered to be negligible.
- 1.10.6 Although negligible air quality impacts were predicted as a result of the development, a number of mitigation measures have been identified. These included the following in order to reduce any deviation from baseline air quality conditions in the vicinity of the site:
- Provision of a Travel Plan;
 - Inclusion of measures to encourage cycling;
 - Inclusion of green infrastructure throughout the development;
 - Consideration of final building configurations to avoid the creation of street canyons;
 - Provision of electric charging points throughout the development; and,
 - Minimum emission standard for gas fired boilers.
- 1.10.7 In summary, the assessment of potential air quality impacts associated with road traffic exhaust emissions from the revised proposals indicated effects would not be significantly different from those related to the consented scheme. Although negligible effects were predicted, a number of mitigation options are identified in accordance with the relevant guidance to control emissions from the development and minimise increases in pollution levels as a result of the proposals.

1.11. Noise

- 1.11.1 The noise assessment considers the current noise environment in the vicinity of the variation of condition application site and potential likely significant effects on the proposed mixed use development.
- 1.11.2 Baseline noise surveys have been carried out to establish ambient noise levels, which have been used to set noise limits for construction works and for post-construction operational noise in accordance with planning guidance.

- 1.11.3 Construction noise impacts will depend on the distance of construction works from noise sensitive receptors. Appropriate mitigation, such as selecting quieter plant and construction methods and the use of acoustic screens will be used to keep construction noise within acceptable limits.
- 1.11.4 The changes to traffic volumes associated with the proposed 2015 SA1 layout present noise levels that are the same as those for the 2010 SA1 layout for which planning approval has been granted.
- 1.11.5 The buildings within the proposed development will be designed to provide the required acoustic performance to ensure that internal noise levels comply with the guidance set out in the relevant standards.

1.12. Ecology

- 1.12.1 An ecological walkover survey and desk study was undertaken in October 2014 to establish whether the development site had changed since the previous surveys that informed the consented planning developments had been undertaken. The local records centre was contacted and a web-based search undertaken to establish whether there were designated sites of nature conservation importance in the vicinity of the development area that had the potential to be affected by the proposals. This desk top study also included a search for records of protected and notable species.
- 1.12.2 There were several sites of nature conservation importance within 2 km of the development area, but no effects on these sites were predicted and as such it is considered that they would not be affected by the development proposals. The field survey revealed that the plots had been cleared in the recent past to facilitate development. Although, plants had re-established on several of the development plots, no habitats of nature conservation importance were identified. Some of the plots had the potential to support nesting birds and reptiles. Consequently, steps will be taken to ensure that their populations are protected. The invasive plant species Japanese Knotweed was also found on site. However, the development area as a whole was considered to be of limited nature conservation value.
- 1.12.3 The following mitigation measures will be incorporated into the site clearance programme and method statements.

The River Tawe and Adjacent Docks

- 1.12.4 Pollution control measures that follow best practice guidelines will be implemented during construction to safeguard water quality. A sustainable drainage system separated from the underlying ground conditions by means of a liner could form part of the scheme design to protect water quality once the site is operational.

Reptiles

- 1.12.5 While no records were found following a programme of surveys, common and widespread species of reptile (slow-worm, common lizard and grass snake) could be present within the development area. An additional survey would be undertaken to confirm the presence/absence of reptiles, and if reptiles are present a strategy would be produced so that they are protected.

Nesting Birds

- 1.12.6 The development area is not of value to nesting birds. Nevertheless, their potential presence represents a seasonal constraint to site clearance. If vegetation clearance take place in the period March 1 to 31 August, then surveys will be required to confirm the absence of nesting birds. If they are found to be present, site clearance in the vicinity of the nest would need to be delayed until the young chicks have left the nest.

Japanese Knotweed

- 1.12.7 A plan to remove Japanese Knotweed from the development area will be produced in advance of site clearance to avoid the spread of this invasive plant.

Enhancements

- 1.12.8 The Landscape Strategy provides the opportunity to create habitats of value to wildlife as part of the development proposal. For example shrub planting would provide habitat suitable for nesting birds. Overall, the scheme would not have a negative effect on wildlife and there is the potential to create habitats of value to wildlife within the landscaping proposal.
- 1.12.9 The site proposals will not have a direct effect upon nationally or regionally important nature conservation designations in the wider area and it is not considered to alter the value of these eco-systems. By increasing the bio-diversity opportunities through the new proposals across SA1, the proposed development can be considered to positively support the wider ecology systems within the area.

1.13. Landscape and Visual

- 1.13.1 The existing landscape within the SA1 Development is a mix of the typical vegetation to be found on a derelict dockland site and the more recent ornamental landscape associated with the new roads, developments and the public open space areas.
- 1.13.2 It is evident that the implemented schemes of the site area have taken reference from the Design Development Framework strategy (2004) and the use of semi-mature street trees, ornamental shrub planting and robust hardy perennial mixes all support the urban fabric.
- 1.13.3 The empty plots are all derelict cleared dockland sites. Elsewhere on the site there is a mix of hard landscape elements within the public and private spaces. There have been no notable developed spaces since 2010. The 2015 assessment has, however, had regard to recently designated public rights of way in the area.
- 1.13.4 It is noted that the immediate context is more of a townscape character than landscape, with the exception of Kilvey Hill to the north. The Industrial docklands form part of the cultural landscape to the area and is regarded as a major influence on the development of the city.
- 1.13.5 The site is currently 'between' townscape characters – partially medium scale built form where development has taken place interspersed with empty 'derelict' dockland sites.

Visual Context and Existing Views

- 1.13.6 The various development plots within the overall site have different levels of visibility and the extent of this will change as other plots are developed. Local landmarks and listed buildings include Grade II - Ice House factory (chimney), J-shed, Norwegian Church and the newly built Sail Bridge. The tall, historic church steeple of Saint Thomas Church is a vital characteristic of the Saint Thomas skyline, visible from a variety of distant locations within the site.

Assessment of Revised Scheme – Landscape Effects

- 1.13.7 It is considered that overall the effect of the proposals on landscape and townscape Character will give a moderately beneficial impact to the existing landscape character as the overall character of the site is transforming to one of more built form, which is appropriate to the townscape setting.
- 1.13.8 The proposed development will not affect the Seafront or beach areas but will provide additional areas of riverside development and thus reinforce the character of development along the estuary. The development itself will therefore have a moderately beneficial effect on the Seascape and its immediate character surrounding the site, including the Tawe Riverside Walk which is considered to be an area of landscape value.
- 1.13.9 With regards to the cultural landscape, although the site proposals have altered the dockland area around the Prince of Wales Dock in particular to an urban character, the original dock use is still present as a perceivable influence on the area. The site development will help clarify and strengthen the boundary between city and working dock as it currently occupies some large empty development plots awaiting regeneration.

Assessment of Revised (2015) Scheme - Visual Effects

- 1.13.10 The visual assessment has been based on the existing viewpoints presented in the 2010 AES with 2 additional locations identified during the review process and by identifying the Zone of Theoretical Visibility (ZTV). These form representative views from visual receptors within the study area.
- 1.13.11 By comparison to the 2010 AES proposals, it is considered that overall the visual effect of the 2015 proposals are expected to have a moderately beneficial effect on the viewpoint locations, taking into account the operational phase set within the city context. It is noted that the 2010 assessment did not identify any beneficial impacts from the development proposals, with an overall assessment of slight to moderately adverse impact.
- 1.13.12 The 2015 proposals are seen to have a positive and therefore beneficial impact on five of the views, usually where the context of the site is of urban form and further development will contribute to and enhance the existing composition of the view. The majority of the views (thirteen) are seen to have a neutral or negligible potential level of effect. Only one of the views is assessed to have an adverse effect (viewpoint 17) due to the loss of visual connection from Swansea beach to Kilvey Hill.

Cumulative effects

- 1.13.13 The proposed Tidal Lagoon Swansea Bay will only affect views that are seaward of the site, such as views to the north of the SA1 area. As the lagoon will be low-lying in its nature the visual effect will be low as it will not break the skyline against the backdrop of the sea. It is therefore considered that the cumulative visual effect would be negligible.
- 1.13.14 Swansea City Centre: Strategic Framework Review presents CCSC aspirations. The proposals outlined in this draft Review are considered to have a positive beneficial effect alongside the SA1 development proposals as both schemes aim to increase the quality of the public realm and inter-connectivity between the city centre and Swansea Waterfront.
- 1.13.15 The cumulative effect of the proposed Fabian Way Wind turbine application by Swansea Bay Water Treatment Works, when combined with the SA1 development in relation to visual impact are not considered to be significant.

Landscape and Visual Mitigation and Enhancement Measures

- 1.13.16 The proposed development is predicted to have a positive effect on both the landscape character and visual amenity.
- 1.13.17 When compared against the 2010 masterplan, it is considered that the 2015 SA1 Waterfront Innovation Quarter Masterplan would lead to beneficial improvement to the area as a whole. Where the previous 2010 'leisure quarter' scheme included some large and bulky massing of buildings, the peninsula development proposed by UWTSD and the Welsh Government is more refined. The scheme is considered to sit more favourably in terms of scale and permeability, allowing it to 'knit' into the urban fabric of the City Centre.

1.14. Archaeology and Cultural Heritage

- 1.14.1 The Archaeological and Cultural Heritage assessment prepared by Glamorgan Gwent Archaeological Trust (GGAT) assesses the potential for the development to give rise to effects on the archaeological resource. It also devises suitable mitigation methods to reduce any adverse effect and enhance any beneficial effect. The assessment reviewed current information regarding the archaeological resource of the study area, updating the initial desk-based assessment conducted in 2002 (2002 WAES), with an addendum in 2010 (2010 AES).
- 1.14.2 The 2002 assessment noted the presence of 200 sites of archaeological interest within the study area, which included land beyond the current planning application site boundary. Utilising an identical study area, the current assessment has identified an additional 128 sites. A total of 47 sites are located within the planning application boundary, though not on UWTSD development plots. These include two Listed Buildings, the J Shed and the Flag Ship Building.
- 1.14.3 It has been assessed that the proposed overall development will have a 'Beneficial' effect on two sites, the Prince of Wales Dock and the Prince of Wales Dry Dock and a 'Major' effect on four sites, Riverside Terminus, Vale of Neath Railway, Patent Fuel Works and Lock.
- 1.14.4 However, only the Prince of Wales Dry Dock and the Lock are located in the area subject to the 2015 masterplan changes. As a result the 2015 changes will have a 'Beneficial' effect on a single site (Dry Dock) and a 'Major' impact on a single site (Lock).

- 1.14.5 Furthermore, it is considered that the development will have an indirect effect on a total of ten sites of Regional importance, with magnitudes of effect ranging from 'Very Slight' to 'Considerable'. However, the previous assessments (2002 and 2010) did not consider any potential indirect visual effects of the development on archaeological sites. As a result, the current assessment has considered the indirect visual effects of the entire development area, rather than being restricted to the areas subject to the 2015 masterplan changes. However, it is likely that if the areas subject to the 2015 masterplan changes were considered in isolation, then the indirect visual impacts on the sites noted above would be lessened.
- 1.14.6 The Riverside Terminus, Vale of Neath Railway, Patent Fuel Works and Lock are all located in the proposed positions of buildings. Consequently, any intrusive groundworks required for the construction of such buildings will require an archaeological watching brief in order to record any surviving features or structures.
- 1.14.7 Additionally, geotechnical investigations (2002 WAES) have identified peat deposits, up to 4m in depth, below approximately 3.5m of made ground in the development. The 2010 update (2010 AES) noted that the only potential threats to the peat deposits are from the excavation of underground car parking. Any such excavations should also be monitored by an archaeological watching brief, with a particular emphasis on a peat sample strategy and subsequent analysis.
- 1.14.8 The above mitigation measures are designed to reduce the adverse effect of the development on four sites of archaeological interest from 'Major' to 'None' by providing suitable preservation by record of any surviving remains. As a result the residual effect will be 'None'.

1.15. Waste and Recycling

- 1.15.1 The assessment of the change in impact and management of waste and recycling due to the updated masterplan has considered the whole development but focused on the changes to the Peninsula area of the SA1 Waterfront Innovation Quarter.
- 1.15.2 Since 2010 a number of the development plots have been completed and the majority of on-site demolition and cut-fill earthworks operations have been completed. As such, only minor demolition and excavation works remain to be undertaken.
- 1.15.3 Construction waste would be generated as a result of general handling losses and surpluses and that this would be mitigated via good site practices including; proper handling and storage, efficient purchasing, waste segregation in order to maximise reuse/recycling, and use of suppliers who reuse/recycle packaging.
- 1.15.4 It is estimated that the Scheme will produce around 12,250 tonnes more CD&E (Construction, Demolition and Excavation) waste compared to 2010 based on comparison of development floor area. However, as the major earthworks and demolition works have already been completed so the true forecast will be less than this. CD&E waste will be forecast in more detail during the later stages of the design process through the production of the SWMP (Site Waste Management Plan)
- 1.15.5 Waste will be produced as part of the operation of the completed Scheme. In 2010 the estimate of operational waste per year was 1240 tonnes. The current proposed change to the masterplan represents a less than a 10% increase in floor area and theoretical change in generated waste.

- 1.15.6 CD&E waste production is assessed to have a slight/moderate adverse impact and operational waste production is assessed to have a slight adverse impact.
- 1.15.7 Proposed mitigation measures include considering designing out waste principles during the detailed design stages, employing best practice on site (including a site waste management plan and a CEMP – Construction Environmental Management Plan identifying good site practices).
- 1.15.8 Waste from the built environment during the operational phase of the development would be mitigated against by facilitating and encouraging recycling via paper collections, road side plastic and metal can recycling, bottle banks, plastic, textile and metal can recycling points. The residual effects for CD&E and operational wastes are assessed to be minor adverse.

1.16. Infrastructure and Services

- 1.16.1 The existing infrastructure on the SA1 site provides for fully serviced development plots with connections to the adoptable highway and public drainage network. The primary road links contain foul drainage together with spurs for plot drainage and other utilities contained within the footways.
- 1.16.2 The southern section of Kings Road and eastern section of Langdon Road, although partially completed, are intended to service the adjacent plots. Any works outside of the curtilage of the identified development plots to accommodate the new development would be progressed by Welsh Government.
- 1.16.3 Infrastructure works to complete the SA1 Waterfront Innovation Quarter development will include the re-alignment of Marina Road to connect with Langdon Road and a new pedestrian footbridge linking the proposed SA1 development with Plots E & F. This will create new development plots and provide links/access to larger site infrastructure network.
- 1.16.4 There are highways and utilities in Kings Road and Langdon Road which are the main access to the development plots. The proposals will lead to an increase in vehicular traffic and utilities demand. The SA1 development as a whole has been designed with a similar usage in mind and there are no major alterations required to the as-built infrastructure as part of these revised masterplan proposals from the 2010 AES.
- 1.16.5 The services and infrastructure strategy will continue to locate drainage and service routes below the road, cycle and footpath network thereby minimising the need for separate service corridors. To date pumping stations and sub-stations have been accommodated within building plots.
- 1.16.6 An energy centre will be established as part of the development located within the peninsula area. This will be integrated within a University occupied building. The Peninsula site is expecting to provide a localised district heating network served from the energy centre. Such a low carbon technology will make available heating to the future built environment as it develops.
- 1.16.7 The City and County of Swansea Council has recently been developing a strategy for a city-wide district heating network. The Council's consultants have indicated that the SA1 site could be connected to the wider network at some point in the future creating further robustness in the solution.

Mitigation and conclusions

- 1.16.8 The construction of a new footbridge across the access to the Kings Dock will reduce journey times and enable pedestrians and cyclist to pass around the Prince of Wales Dock and link the southern end of Kings Road with Marina Road/Langdon Road.
- 1.16.9 The newly constructed footbridge will allow pedestrians and cyclists from the Peninsula site direct access to the proposed sports hall without having to circumnavigate the whole of the Prince of Wales Dock.
- 1.16.10 There is potential for small scale solar or wind generation on the development - this would require specialist advice with regards to viability.
- 1.16.11 No adverse effects are identified and the proposed revised masterplan broadly follows the previous masterplan from the 2010 AES and will have no major impact on the infrastructure for the SA1 Waterfront Innovation Centre.

Highways

- 1.16.12 The Peninsular site will benefit from a shuttle bus which will operate to connect the proposed SA1 development to the wider public transport network. The shuttle bus would be able to turn on site at the existing turning head on the southern end of Kings Road, adjacent to the partially constructed Tidal Basin. The Revised SA1 Masterplan layout shows a loop with a possible bus gate feature crossing the Plaza. The new access road will also be used to access the residential and hotel developments at the southern end of the peninsula site.
- 1.16.13 Marina Road is to be re-aligned to form a new junction with Langdon Road and create a more developable plot layout towards the north eastern end of Plot E.
- 1.16.14 All access roads are recommended to be constructed to a level no more than 0.3m below the T1000 (once in a millennium) flood level to allow emergency vehicular access in extreme flood events.

Footbridge/cycleway

- 1.16.15 The construction of a new footbridge across the access to the Kings Dock will enable pedestrians and cyclist to pass around the Prince of Wales Dock and link the southern end of Kings Road with Marina Road/Langdon Road.
- 1.16.16 The newly constructed footbridge will allow pedestrians and cyclists from the SA1 peninsular site direct access to the proposed sports complex (and to residential areas beyond) without having to circumnavigate the whole of the Prince of Wales Dock.
- 1.16.17 The Revised SA1 Masterplan proposals broadly follow the previous masterplan from the 2010 AES and will have no major impact on the infrastructure for SA1.

1.17. Socio-Economic

- 1.17.1 The 2002 WAES assessed the socio-economic impacts of the proposed developments at SA1. At that time the site was largely vacant, but with the Technium having been recently completed the vision for a prime location for business development was being established.
- 1.17.2 The 2010 AES identifies completed development on 16 plots since 2010 and concludes that the proposed changes to the 2003 outline permission would generate circa 3,761 jobs as a result of the proposed masterplan.

- 1.17.3 UWTSD has a significant and notable positive impact on the economy, particularly in Swansea. Economic output also has a positive impact on the wider Welsh economy with the impact of UWTSD activities making a positive contribution as part of the network of Higher Education Institutions throughout the Wales and the wider UK.

Social and Community engagement

- 1.17.4 In summary, the academic and non-core University developments proposed through the revised Masterplan will play an important role in enabling UWTSD to build on their existing work as a facilitator, or enabler, for social and community engagement in the area.
- 1.17.5 The Masterplan proposals make provision for the following development projects which are all proposed to be available for use, to varying degrees, by local community groups, organisations and the general public:
- Enhanced Sports provision
 - The erection of a new multi-use Library and Resource Centre
 - New welfare and pastoral care facilities offered to staff and students.
 - New and refurbished catered venues and bookable rooms for meetings and function; and
 - New and improved pathways and amenity areas within SA1, ancillary to the enjoyment of those visitors using the area for meetings and attending functions.

Economic (Planning) Policy framework

- 1.17.6 The revised proposals are designed and intended to be in accordance with the current and emerging, generally supportive, planning policy framework published by the City and County of Swansea.
- 1.17.7 The proposals are governed by, and respond to, the following core planning policy objectives, references to the evidence base and planned responses as set out within Planning Policy Wales, Technical Advice Notes and the City and County of Swansea's Unitary Development Plan:
- a) The presumption in favour of sustainable development by means of supporting the growth aspirations of a Higher Educational Institution which generates a high relative economic output to the Welsh and UK economy (per FTE employees).
 - b) Meeting the development needs of the area by fully utilising (concentrating and consolidating on) previously developed land identified as such
 - c) Actively managing patterns of growth, aligned with commercial enterprise requirements, reducing the travel demand of university and commercial partners, and increase more sustainable modes of travel through a balanced package of travel plan measures.
 - d) Supporting local strategies to improve social and cultural well-being for all, and helping to deliver facilities available for the community and services to meet local needs; and

- e) The need to manage UWTSD operations in a sensitive manner through the means of a masterplan which will enable UWTSD to act as a facilitator and supporter of economic and social change in support of local suppliers, private landlords, shops, services and facilities.

- 1.17.8 The delivery of a phased programme of development and redevelopment proposals supporting both academic (operational), welfare and pastoral care initiatives, will generate additional expenditure in the City and beyond.

Student expenditure estimates

- 1.17.9 Notwithstanding the direct and indirect economic benefits arising from the phased construction activity to deliver what is estimated to be a c£200million masterplan building programme, and the university's direct outputs (staff salaries, research contracts and purchasing), projected UWTSD student expenditure at 2021 is estimated to be approximately £52.6m per annum (at current prices), much of which is estimated to be spent within the region. This is an increase of approximately £5.7m per annum.
- 1.17.10** These estimates extract UWTSD revenue from student accommodation in both the base year (£0.804m). No student accommodation is proposed to be funded and managed by the University in future following its consolidation of its activities in Swansea at SA1.
- 1.17.11 Conservative estimates suggest that, in addition to direct UWTSD operational activities, UWTSD students currently spend in the order of £46.9m annually, £0.804m going to UWTSD for on-campus accommodation costs and around £10.240m going to private landlords across the City.
- 1.17.12 Removing all housing and tuition fees, the estimated annual spend generated by UWTSD students in terms of living costs is in the order of £21.958m. Given the distribution profile of students, it is reasonable to estimate that a large proportion of this spend is made locally within Swansea.
- 1.17.13 Applying student projections, it is estimated that the student spend at the completion of the core academic projects at SA1 would be in the order of £52.599m per annum, of which c£37.104m would relate to residual expenditure taking tuition fees into account.
- 1.17.14 Student expenditure locally is therefore considered to add considerable economic value to local shops and services, and would be in addition to the direct economic output generated by annual university activities.
- 1.17.15 Expenditure generated by visitors to the UWTSD estate in Swansea is considered to have a minor long term positive effect on the underlying viability of existing businesses and suppliers.

Job Generation

- 1.17.16 The masterplan proposals relate only to a part of the SA1 area granted outline planning permission in 2010. The area the subject of the current masterplan revisions will accommodate a mix of uses, including, but not limited to, University activities, commercial (office, enterprise and research uses), hotel, retail, restaurant and leisure venues and sporting activities.

- 1.17.17 Using accepted employment to floor space benchmarking ratios, it is estimated that the number of full time equivalent jobs generated by the non-University activities will be in the order of 2,632 once the development has been built-out. This figure excludes the projected c580 university staff who will be based in Swansea.

Economic Impact of Construction

- 1.17.1 Research undertaken by the UK Construction Group (UKCG “Construction in the UK Economy” 2009: Updated in May 2012) concludes that every £1 invested in construction generates £2.84 in total economic activity. Construction is also defined as a ‘jobs creator’ - the sector being over three times more labour intensive than financial services and provides jobs for people from all educational backgrounds. UKCG also concludes that the construction industry has a very low reliance on imports. Construction imports less than 8% of its supply, meaning investment in construction is retained in the UK.
- 1.17.2 UKCG has also concluded that up to 95 pence in every pound spent on construction in different regions of the UK is retained in that locality – boosting the local economy. In the wider context, every £1 spent on construction yields a return of 56p to the Exchequer – net investment is therefore 44p in the pound.
- 1.17.3 Applying these ratios to the SA1 development project, and based upon a total construction value of c£200m, the added value to the UK economy arising from the project would be in the order of £568m, with up to £539.6m being retained in the local South Wales region.

Socio-economic conclusion

- 1.17.4 The masterplan proposals will deliver a programme of phased academic (operational) and privately funded commercial, residential and quasi-leisure (retail) construction projects to support the growth aspirations of the University and the newly created expansion of the Central Business District in which it will be located. The proposals seek to not only redress current academic accommodation deficiencies, but also to meet modest increases in student and staff projections over the masterplan period.
- 1.17.5 One objective of the masterplan is therefore to retain and enhance the strong position UWTSD has within the Higher Education sector in Wales. This will enable UWTSD to retain and attract new staff and students and support a balance of uses across the SA1 waterfront regeneration area to meet local needs. The masterplan proposals are therefore considered to lead to significant positive, permanent and long term economic benefit to the local, regional and UK economy.
- 1.17.6 While the University’s cultural impact is difficult to tangibly measure, empirical evidence suggests that the range and nature of its community engagement at a number of levels, results in significant and positive cultural and community impact in the locality. Enhanced facilities delivered through the masterplan period offer opportunities for ongoing cultural and community benefits and a stronger relationship between the University and the local groups and organisations.

1.18. Conclusions

- 1.18.1 This ESA refers to the multi-disciplinary approach undertaken by the appointed consultant team. Proposals are presented as a considered response to the site, its wider setting and the town planning framework. Where required, mitigation measures have been identified in line with appropriate and prudent site and estate management objectives.
- 1.18.2 In short, the masterplan proposals will cement the University as a catalyst for change and in support of both sustained economic growth and cultural engagement for the city of Swansea.
- 1.18.3 The key elements that will help deliver the University's vision are joint infrastructure investment; developing the SA1 masterplan to reflect the new joint economic/ educational regeneration delivery opportunity; a targeted joint approach to engagement with business and the promotion of entrepreneurial, research and commercialisation opportunities.
- 1.18.4 The Welsh Government and UWTSD as the major landowners in SA1, are committed to the economic and social regeneration of the whole Swansea Bay City Region. They have agreed to work together as partners. Their objective is to develop a joint vision, the Waterfront Innovation Quarter, to maximise the positive impact the development of SA1 can bring to Swansea City Centre and the wider Swansea Bay City Region.

The role of the University as a catalyst for change

- 1.18.5 The University of Wales Trinity Saint David SA1 project is both a participant and catalyst in this broader pattern of change in Swansea. At its core is the mission to equip students with the training and skills necessary to enable them to lead in the creation of the new knowledge intensive economy of Wales.
- 1.18.6 The economic, social and cultural context of Wales is changing in response to remorseless global scale forces. The University of Wales Trinity Saint David SA1 project is a vital component of Swansea's response, aimed at capturing the potential benefits for the graduates of the University and for wider society.

The Swansea Waterfront Innovation Quarter

- 1.18.7 Planning policy has supported the regeneration of the SA1 area for many years. The development proposals set out within this document are consistent with adopted Unitary Development Plan policies, emerging Local Development Plan policies and are aligned with the aspirations of the City and County of Swansea as relayed in the January 2015 City Centre Strategic Framework Review. The proposals seek to refine and develop previous masterplan proposals to facilitate the creation of a consolidated University at the heart of a mixed use commercial area of an extended City Centre.

Working in Partnership – a process of collaboration

- 1.18.8 The masterplan process underpinning the variation of condition planning application has involved a multi-disciplinary consultant team engaging with the University and third party interests over a 12 month period. The University facilitated and participated in numerous design team meetings, briefing sessions and interactive workshops with the Welsh Government (as landowner and joint applicant), the Design Commission for Wales, the Prince's Foundation Building Communities and the City and County of Swansea.
- 1.18.9 Representations received during a six week public consultation process have been evaluated and have not only shaped elements of the masterplan strategy and the design code but will also refine and develop future plot management strategies during and after the development has been delivered.

Reference Documents

- 1.18.10 The ESA is one of a number of core documents submitted to the City and County of Swansea, as Local Planning Authority, in support of a variation of condition application. Other documents include:
- a) Design and Development Framework Part 1: Planning Design and Access Statement (collated by Stride Treglown Limited)
 - b) Design and Development Framework Part 2: The Design Code (Prepared by Stride Treglown Limited and the Princes Foundation Building Communities)
 - c) Transport Assessment (prepared by Hyder Consulting)
 - d) Draft Travel Plan (prepared by Hyder Consulting)
 - e) Statement of Community Involvement (jointly prepared by UWTSD and Stride Treglown Limited)

2. Introduction

2.1. Introduction

- 2.1.1 This Environmental Statement (ES) has been prepared and is submitted as part of the suite of documents forming a variation of condition application to facilitate the implementation of a revised set of masterplan proposals across the SA1 waterfront area of Swansea. The variation of condition application is made in the joint names of the Welsh Government, the original applicant in 2002 and again in 2008, and the University of Wales Trinity Saint David (“UWTSD”).
- 2.1.2 The masterplan revisions seek to replace part of the approved (2010) masterplan underpinning an outline planning application at that time.
- 2.1.3 This ES Addendum has been prepared with the support of a team of specialist consultants and collated by Stride Treglown Ltd on behalf of UWTSD. The project team and their individual responsibilities in relation to the preparation of this ES Addendum are as follows:

Discipline / Assessment	Consultant
Ground Conditions	Hyder Consulting
Ecology	Hyder Consulting
Traffic and Transport	Hyder Consulting
Archaeology and Cultural Heritage	Gwent Glamorgan Archaeological Trust (GGAT)
Noise Assessment	Hyder Consulting
Air Quality	Hyder Consulting
Landscape and Visual Impact	Stride Treglown Limited
Socio-Economic	Stride Treglown, drawing upon work undertaken by DTZ and UWTSD.

- 2.1.4 This Environmental Statement Addendum is prepared in support of an application to vary outline planning permission 2008/0996, granted on the 11th October 2010. The application seeks to vary planning conditions relating to the site masterplan, development capacities, those that included references to the original and first Addendum Environmental Statement and conditions that are no longer relevant.
- 2.1.5 Chapters 3 and 4 provide greater detail as to the description of the proposed development as set out in the revised masterplan, and the alternatives considered.
- 2.1.6 By way of background context, UWTSD plans to create a vibrant new innovation quarter in the heart of Swansea. The university’s ambition is to provide a smart, sustainable inclusive way of learning, working and living in the city.

- 2.1.7 The development will be home to UWTSD and commercial and cultural partners with cafes and restaurants, small-scale retail, hotel and leisure facilities, residences, public green spaces and sports and recreation facilities.
- 2.1.8 The revised masterplan proposals for SA1 propose the creation of 4 interlinked neighbourhoods, each containing part of the University's accommodation requirement. Commercial and cultural partners will be encouraged to utilise the additional development capacity within each neighbourhood.

2.2. Structure of the Statement

- 2.2.2 In preparing and submitting this ES Addendum, UWTSD (as joint applicant) along with the appointed consultant team has taken account of the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 1999 (the EIA regulations).
- 2.2.3 Schedule 4 of the EIA regulations sets out the information to be included within an ES; this is set out below:

Schedule 4 Requirement	Location within ES
A non-technical summary	Chapter 1 (also presented as a stand-alone report)
Introduction	Chapter 2
Description of the Development	Chapter 2
Outline of the main alternatives examined and reasons for the choice	Chapter 2
Scoping Methodology	Chapter 2
A description of the likely significant effects of the development on the environment	Chapters 4-16
Cumulative impacts	Chapter 4-16
A description of the measures envisaged to prevent, reduce or offset any significant adverse effects	Chapter 15-16

- 2.2.4 A site location plan is provided at Appendix 2.1 and a series of site photographs are presented at Appendix 2.2.

2.3. Description of the Project

Introduction

- 2.3.2 This Environmental Statement Addendum accompanies a variation of condition application to amend outline planning permission 2008/0996, granted on the 11th October 2010.

- 2.3.3 A variation of condition application was previously accepted to allow for a revision to be made to the total development capacities for SA1 and for the capacity levels to be set by an addendum Environmental Statement in 2010.
- 2.3.4 The 2010 variation of condition [permission] also facilitated changes to the timing of the programme of phasing, allowing a review of the approved Land Use Masterplan and the Design and Development Framework to take place at appropriate intervals.
- 2.3.5 Given an ongoing refinement of the accommodation requirements of the University, an estimate of the likely total schedule of uses and quantum of accommodation was calculated at the time of the EIA Scoping Opinion in December 2014. This was based upon the application of development densities to identified plots. This was generated to act as a comparator to ensure that such a quantum of development can be adequately served by the existing highway network and infrastructure provision.
- 2.3.6 As the preferred masterplan concept emerged, the total capacity of the area and indicative schedule of accommodation has been refined and additional sensitivity tests undertaken.
- 2.3.7 The indicative masterplan proposals underpinning the variation of condition application has not materially changed since the comparator scheme was presented to the Council. The technical assessments presented within this ES Addendum are based upon a “fix for planning assessment purposes” in January 2015.
- 2.3.8 The revised masterplan sets out an important aspect of a university-wide transformation project that will embrace all elements of the UWTSD experience – looking at how the curriculum should be delivered in the future and what spaces and buildings will best support these activities. Faculties for all campuses will be working together to define the University’s future learning landscape.
- 2.3.9 Further information relating to the University’s accommodation needs and the underlying initiatives helping to shape these needs is presented in Section 3 of the Planning Design and Access Statement, submitted under separate cover.
- 2.3.10 The Swansea Waterfront Innovation Quarter continues the University’s tradition of evolution to better meet the educational needs of the region. As the curriculum develops over time, and the learning and teaching approach changes to embrace Information Technology and changing student expectations, it is imperative that the University’s physical estate – its buildings and its surroundings area – supports rather than constrains the learning the research activities of the University.

Partnership Working

- 2.3.11 The aim of the University’s partnership with the Welsh Government is to further define Swansea as an Innovation City through establishing a range of impact hubs in identified priority areas to deliver clear economic and commercial benefits and creating a critical mass of expertise that can attract new companies, partnerships and investment. It will also build an integrated innovation and enterprise system that will facilitate the transfer of knowledge and collaboration between industry and academia, and bring worldwide best practice to Wales to link with or complement the best of Welsh creativity and innovation, thereby playing a major role in the regeneration of the City and the Region.
- 2.3.12 In addition, the partnership will assist UWTSD to fulfil its core mission of improving access to higher education and skills development that it relevant to local communities and employers, enhancing the employability of its graduates, and ensuring that Higher Education provided by the University fulfils its potential in contributing to, and otherwise securing economic regeneration in the Swansea Bay Region.

Use Classes

- 2.3.13 The principal use of the buildings proposed for development fall within the following uses classes as set out in the Town and Country Planning (Use Classes) Order 1987 (as amended):
- 1) University (academic) accommodation – Use Class D1
 - 2) Commercial Offices, Research and Development and Light Industrial – Use Class B1 (a), (b) and (c).
 - 3) Residential accommodation – Use Class C3
 - 4) Retail uses – Use Class A1
 - 5) Restaurants, Cafes and licensed premises – Uses Classes A3
 - 6) Sports and Recreation uses (associated with University activities)
 - 7) Galleries and exhibition spaces
- 2.3.14 New buildings will be complemented by a series of connected vehicular and landscaped pedestrian routes and public spaces.
- 2.3.15 The masterplan also makes provision for a canal reservation corridor which has the potential to facilitate a direct water connection between the western end of the Prince of Wales Dock and the River Tawe. This accords with the previous 2003 and 2010 SA1 outline planning permissions and a long-standing planning policy position set out by the City and County of Swansea as Supplementary Planning Guidance. The delivery of a canal connection would be the subject of a separate detailed planning application, supported by appropriate technical assessments.
- 2.3.16 Further information relating to the distribution of buildings, spaces and uses is presented in Section 5 of the Planning Design and Access Statement, with area by area detailed character studies and descriptions presented in Section 9.

Site Description

- 2.3.17 The SA1 site lies to the south of the main shopping areas and civic hub of the city and to the immediate east of the Maritime Quarter – the first area of the docklands to undergo regeneration. The new Swansea University Bay Campus (under-construction) lies to the east on a former BP site. The proposed Tidal Lagoon (tidal power station and recreational project) also lies to the south east of the site. The current active trading Port of Swansea is now concentrated on the Kings Dock and Queens Dock (to the south of the Prince of Wales Dock) where there are both extensive cargo facilities.
- 2.3.18 The sites secured by UWTSD for regeneration purposes are located across the area known as SA1 on former docklands, close to and to the east of, the City Centre. This area lies within the central part of Swansea Bay, on the east side of the River Tawe where it joins the Bay. The Bay stretches from the Mumbles and the Gower Peninsula in the west to Port Talbot and Porthcawl in the east.
- 2.3.19 The site is generally flat and lies between 6 and 7 metres above ordnance datum (OD). In the wider context, the highest local point is Kilvey Hill to the north of the site at 190m. These hills form a backdrop to the site when looking north and northeast.

- 2.3.20 A site plan is set out at Appendix 2.1. Further information relating to the site, its character, appearance and history is presented in Section 4 of the Planning Design and Access Statement.

Land Ownership

- 2.3.21 The development site is owned by a range of different organisations, businesses and individuals. Land title searches undertaken by solicitors acting on behalf of the University have identified all registered 'owners' and Notice of the submission of the application has been served on all owners. UWTSO own 25 acres of the site, while the Welsh Government, as joint applicant, also own large undeveloped areas of the site. The key focus of the application and areas of change is on land owned by UWTSO.

Proposed Development

- 2.3.22 The development proposed takes the form of an edge of city centre regeneration scheme comprising a number of university and complementary commercial, residential and recreation uses, with associated facilities and infrastructure. Summary details are set out in the table below.

Development	Proposed Uses	Proposed change in Floor Area from that identified in the 2010 outline planning permission (Masterplan)
Peninsula Site	University activities Commercial offices / R&D uses Residential Hotel Ground floor retail / leisure use Multi-storey car park	+14,924m ²
Eastern Zone	Sports Centre complex Residential Small scale retail Multi-Storey Car Park	+13,855m ²
Northern Zone	Mixed uses as granted outline planning permission in 2010 (no change)	No change in floor area proposed.
Landscaping and Public Realm		No floor area proposed
New and amended access roads and junctions		No floor area proposed

- 2.3.23 A Section 73 application provides an opportunity for conditions imposed on a previous planning permission to be revised or removed. The Local Planning Authority also has the opportunity of adding new conditions and the result of a successful application is a fresh planning permission.
- 2.3.24 The focus of the variation of condition application are conditions 2 and 5 which refer to the previous masterplan and development capacities table. It is also proposed to revise or remove other conditions that have been successfully discharged and no longer apply (in which case the application seeks their removal), conditions which remain valid in principle and require updating with reference to policy, guidance or standards which have come into effect since the granting of planning permission in October 2010 and, updating conditions to refer to the revised masterplan, Design Code, Design & Access Statement and 2015 Environmental Statement Addendum. Elsewhere we have sought to rationalise retained conditions to create a more succinct permission.
- 2.3.25 The description of the application can therefore be summarised as follows:
- 2.3.26 Variation of conditions 1 (phasing programme), 2 (SA1 masterplan), 3 (Design & Development Framework), 6 (A1 retail restrictions), 7 (A3 uses), 8 (Submission of reserved matters), 9 (Landscaping details), 10 (proposed levels and reserved matters), 12 (Contaminated land assessment), 14 (air quality mitigation measures), 21 (Ecological mitigation measures), 28 (Archaeology), 33 (Travel Plan) and removal of conditions 4 (Urban Design Guidance), 5 (development capacities), 13 (development levels), 15 (urban design guidance and air quality), 16 (noise and vibration mitigation), 17 (urban design guidance and noise), 20 (waste mitigation), 25 (landscape corridor), 27 (archaeology mitigation measures), 30 (access junctions), 31 (Port Tennant junction), 34 (pedestrian bridges over Tawe), 35 (access consultant) and 36 (bridge enhancement) of planning permission 2008/0996 granted on 11th October 2010.
- 2.3.27 A full overview of the changes is contained in Section 2.1 of the Planning Design & Access Statement

2.4. Alternative Development Options

Introduction

- 2.4.1 This Chapter provides an outline of the main alternatives which were considered by UWTSD and sets out the main reasons for the choices made and which now underpin the masterplan proposals.

Drivers for Estate Rationalisation: 2013

- 2.4.2 The merger of University of Wales Trinity Saint David and Swansea Metropolitan University was completed in 2012 and resulted in an amalgamated organisation that includes campuses in Lampeter, Carmarthen, and Swansea. The combined estate includes a diverse portfolio of modern and older buildings – some of these Grade II listed – reflecting the rich heritage of the founder institutions. The merger document identified the need for an Estates Development Review which would culminate in an Estates Strategy for the new institution by 2014
- 2.4.3 During 2013 the University undertook several internal reviews to agree the high level academic steer for the strategic development of the University. The development of the Swansea estate was a key consideration in these discussions with the following key themes emerging:
- Development of Swansea is crucial to the longer term viability of the University.
 - Developing Swansea provides an opportunity for positioning, complementing, and promoting the distinctiveness of the Carmarthen and Lampeter offer

- Development aspirations should be tested with reference to a gap analysis
- Within Swansea the University will have a presence in a number of locations, and, reflecting the related policy statement and heritage of the organisation, the University will have particular regard to the following key wards: Townhill; St Thomas; Castle Hill, and Port Tennant

The Do Nothing Option

- 2.4.4 Doing nothing was not considered to be an option as the Swansea Estate was too fragmented, has too many duplicated facilities, lacked critical mass and vibrancy, and had a relatively low profile in the City. The “do nothing” scenario would be inappropriate in the context of the wider regeneration of the area and would fail to maximise the benefits arising from its aspirations.

Estates Development Strategy: Jan – Jun 2014

- 2.4.5 The outcomes of the internal reviews fed into an Estates Development Strategy (Spring 2014). This document provides detailed business case analysis on a number of strategic options resulting in a direction of travel for the UWTSD university estate:
- A new campus development in Swansea
 - Predominately backlog / scheduled works at the Carmarthen and Lampeter campuses.

- 2.4.6 The key physical locations will be for the Swansea estate would be:
- The Cultural Quarter, in the heart of the City (Alexander Road, incorporating the Alex Design Exchange, Dynevor, and potentially the Albert Hall)
 - A new Waterfront Innovation Quarter, adjacent to the Maritime Quarter in SA1 (see below)

The SA1 Waterfront Innovation Opportunity: Nov 2013 – Dec 2014

- 2.4.7 The University became aware of the development opportunity offered by the SA1 waterfront area of Swansea during discussions with the Welsh Government in late 2013. From the outset it was evident that as well as offering a prime waterfront location, the site would enable the University to become central to the educational offer in Swansea.
- 2.4.8 Previous planned development work in the area had stalled in 2008/9 during the economic downturn and both City and County of Swansea and Welsh Government were keen to refocus the regeneration strategy. The University offered the ideal development partner and a land transaction was brokered that resulted in the University purchasing circa 22 acres of real estate in an innovative partnership deal with the Welsh Government which was completed in late 2014

The Business Case for Swansea: Jan 2014 – Dec 2014

- 2.4.9 During 2014 (and following another period of detailed analysis), the University consolidated the options for Swansea through a detailed business case analysis.
- 2.4.10 The resulting vision for the Swansea campus was that it would be consolidated in two distinct but connected high profile locations – the Cultural Quarter in Alexandra Road and the SA1 Waterfront Innovation Quarter in the dockland area. These Quarters are not conceived as private and exclusive university campuses but a driving regeneration force for mixed use development that supports vibrant communities in the city centre.
- 2.4.11 Development at the Alexandra Road Cultural Quarter is now substantially complete providing a focus within the City for mixed use education, cultural, and creative industries related businesses.

- 2.4.12 The SA1 Waterfront Innovation Quarter development would provide the majority of the remaining required academic accommodation for the Swansea campus but would require a detailed masterplanning process to unpick and evolve the best use for the land that had been purchased in the arrangement with Welsh Government.

Approach to Alternative Site solutions

- 2.4.13 A series of six SA1-wide strategies were developed by the masterplanning team to capture the main high-level principles that embody the masterplans project's aims. These were used to inform the proposed masterplan strategies. Combined, these provide the framework that sought to bind all the individual proposals together into an attractive, legible and accessible environment. Through this process, we were able to assess the degree to which different organisation models for the University were capable of meeting accommodation and operational requirements. These options, in turn, informed the opportunities to integrate potential commercial, residential and leisure (hotel and retail) partner developments.
- 2.4.14 We set out below a summary of the key issues discussed at the Strategic Options Stage: this covers alternative development scenarios, some of which were discounted for the reasons amplified above, while the merits of others were carried forward in the "Developing the Preferred Masterplan" design stage. During this formative design stage, interactive workshops were held with the Welsh Government, Princes Foundation, Design Commission for Wales and the City and County of Swansea. Aspects of the evolution of the masterplan now presented as presented in greater detail in Section 7 of the Design and Development Framework Part 2: The Design Code.
- 2.4.15 The following section covers the 6 key masterplan principles that informed the range of potential opportunities which we filtered down to a clear mixed use development strategy and schedule of accommodation in the latter design stages.

Principle 1: Integrating SA1 with the city

- 2.4.16 The University wish to ensure that SA1 becomes a distinct district within the wider city centre context, with it own character and identity but which is also well connected to its neighbouring districts. Within the SA1 district is a series of smaller neighbourhoods dotted around to make the docklands, each with its own offer of public open space and activities. The degree to which the proposed development responded to the wider connectivity and supported integrated uses informed the resultant strategy.

Principle 2: Improving access and movement

- 2.4.17 The strong physical boundaries to SA1 means that an overarching access strategy for movement into, and around, the docklands needed to be clear and robust. Managing the integration of pedestrians, cyclists, private vehicular traffic, public transport and servicing at SA1 into the wider city movement network was considered essential. Promoting a development mix and distribution which could benefit from existing and potentially new routes and services guided the university and the masterplanning team towards the attractiveness of certain scenarios.

Principle 3: Maximising the use of the waterfront

- 2.4.18 The development and masterplan was required to be shaped by, and full advantage of, its location at the mouth of the River Tawe, the tidal basin and the Prince of Wales Dock. These three waterfronts offer different opportunities and characteristics. The views out onto each of these waterfronts helped to define the future feel of SA1 and provided a strong reference back to the site's industrial heritage.

- 2.4.19 In relation to this principle, the University was required to make a fundamental decision as to the prominence that its operations took within the wider waterfront setting. Options were presented, based upon the accommodation needs of the University, that potentially places academic operations taking full advantage of the waterfront, with alternatives which placed its operations “behind” (or centrally within the peninsula – once the decision had been taken to focus operations on along the strategic western corridor of SA1) commercial partner buildings. In this scenario, the University could have taken a subservient position within SA1 (from a visual impact perspective) allowing “premium” value waterfront sites being made available to third party partners.
- 2.4.20 As the following sections will demonstrate, a hybrid option emerged as part of the strategic options stage, with a land use pattern which both offered the opportunity for the University to occupy a prominent position looking across to the City Centre, and extending its operations centrally within the peninsula, drawing footfall and connections through the site, enabling commercial partners to be attracted by a prime waterfront sites and supporting a public realm strategy which promoted public accessibility and ground floor active uses along the waterfront.

Principle 4: Connecting congregation spaces and the public realm

- 2.4.21 In order to deliver a successful regeneration of the docks, it was considered necessary to incorporate a series of public open spaces that add character to each zone. These spaces would be used to create life and activity outside and will reflect the nature of the surrounding built developments. The need for a clear hierarchy of hard and soft spaces was identified where the more prominent spaces are complemented with a series a smaller yet linked public spaces. These principles helped to shape the form and distribution of uses in the masterplan and have been carried forward in the evolution of the Design and Development Framework Part 2: The Design Code, in collaboration with the Princes Foundation and others.

Principle 5: Accommodating inward investment and partnership activities

- 2.4.22 The partnership between the University and the Welsh Government is, in part, being driven by the desire to draw in investment from a mix of third parties. The masterplan is tasked with creating an appropriate environment that appeals to a wide range of different organisations that will be attracted to SA1 to work with the University as partners. The result will be a thriving hub of activity for the whole city. These principles help inform not only the position of individual plots available for third parties, but as covered in Principle 3 above, was instrumental in discounting alternative development scenarios which placed university activities across a dominant selection of waterfront sites.

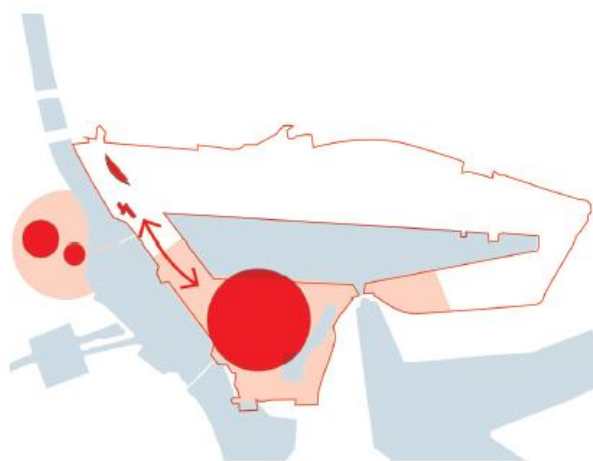
Principle 6: Promoting sustainable development

- 2.4.23 The regeneration of SA1 involved the redevelopment of brownfield land, a former port site with limited ecological value. By incorporating ecological landscape enhancements in key spaces, the area can become a bio-diverse haven for wildlife and flora/fauna. The University aims to develop near carbon-zero buildings to act as paradigms for further third party investors. This will work in tandem with a proposed CHP system to further reduce energy demands on the national grid. The location and distribution of sustainable energy generation and supply measures influenced, in part, the attractiveness of consolidation university operations being delivering in rapid succession, within the peninsula, with options of wider district heating and utility provision being discussed with the City and County of Swansea in tandem with the evolution of the preferred master[plan] strategy.

Strategic options

- 2.4.24 As described above, a consideration of masterplanning principles helped shape a number of strategic options, including “macro” issues such as where within the SA1 site would maximise the operational aspiration and ambition of the University as not only an educational institution in its own right, but also as a catalyst for change and economic regeneration.

- 2.4.25 The starting point for understanding how the masterplan for SA1 could evolve began with interrogating how the university could populate space around the docks. A series of options explored the impact of locating the university in different locations. The university sought to act as a seed for new development, since it will not be in a position to develop out the whole SA1 site itself: the university's specific educational needs only requiring a minority land area within the area. Creating the right environment to attract in commercial partners was, for the reasons set out under Principle 5 above, also considered essential for a successful masterplan.
- 2.4.26 The strategic / alternative options process started with the idea of the university as a single seed through to scattering the university across the whole of SA1. As a result of this exercise, spreading the university's floorspace requirements across 5 different zones (Option E1) would not be an effective development strategy. Instead, creating a smaller number of 'villages' would be more beneficial. However, a single village was deemed to be more likely to create a distinct campus feel, which is not the university's aspiration for SA1.
- 2.4.27 A hybrid of two of 5 core options was deemed to be the most appropriate response. These options seek to build upon the site's close proximity to the city centre to the west and to the site's great relationship with the water. The university already occupies two buildings around Technium Square , as well as the Dylan Thomas Centre on the other side of the river, so the opportunity to tap into these facilities along with the existing social hub around Ice House Square. This will create a series of hubs of activity that work well with partner developments. A summary of the strategic options is presented in Section 6 of the Design and Development Framework Part 1: The Planning Design and Access Statement. In essence, the strategic options, presented in diagrammatic form, are set out below.



option a1 the peninsula



Zone of regeneration influence



University development



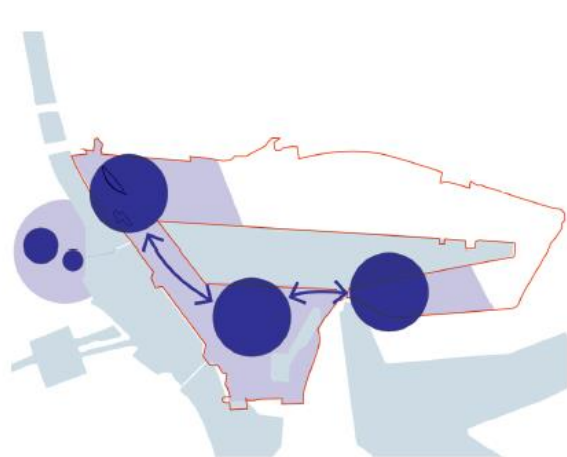
Water



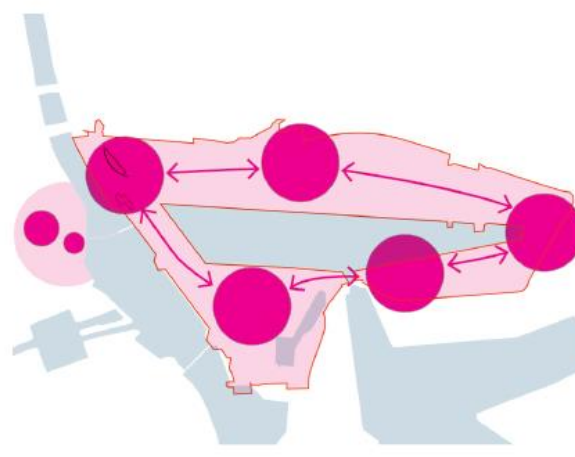
Principal connection



option b1 the peninsula and east-end



option c1 gateway, peninsula and east-end



option e1 the five villages

- 2.4.28 The strategic options stage also presented the university with the opportunity to influence the development along the southeastern plots (Southeast of the Prince of Wales of Docks) in a way that other partners might not manage as successfully. Using the University sports hub to draw people along this part of the site extends the university's presence along an important access route into the main southern zone.

Character areas

- 2.4.29 The alternative development scenarios also considered the way in which masterplan proposals could help define, shape and create new character areas across SA1. These are principles which have been progressed through the masterplan analysis stage, and during numerous design workshops with the Princes Foundation and others.
- 2.4.30 A series of different character areas at SA1 were identified based on both existing characteristics and the potential for distinctive new identities.
- 2.4.31 Each character area provided the opportunity to create a series of key public spaces that would bring each area "to life". Such spaces would be considered at that time, to provide environments for external activities that add vibrancy and a sense of place to each part of the docks. Public spaces would work as much for the local community as it will for the University and commercial partners, in that it would allow for a variety of public activities to occur throughout the year. Creating a sense of neighbourhood will integrate the buildings, spaces and people together.
- 2.4.32 The nature of these spaces will differ depending on their location, function and relationship with the uses of the surrounding buildings.
- 2.4.33 One of the key defining features of SA1, and perhaps its greatest asset, is the water. It presents the University and the whole of the city with the opportunity to create an innovation quarter with a strong relationship with the water. The beauty of a dockside regeneration project lies in the historic importance of the water, and through a series of urban design movements, this relationship can be accentuated. The importance of the water, connections to adjacent destinations, the public realm and the integration of the masterplan proposals with the City Centre informed the design process which started from a site analysis evidence base and university accommodation requirement, and which, through workshop sessions, masterplan principles and the evolution of the preferred masterplan strategy considered a number of alternative development scenarios.

Evolution of the peninsula

- 2.4.34 The proposed masterplan for SA1 is broadly based on the 2010 approved masterplan for the area, though with a number of areas of key change. The most notable of these is the area at the southern end of the site, where the university will become the main catalyst for regeneration.
- 2.4.35 The process of evolving the masterplan, and considering alternative options throughout the process, has resulted in a scheme which has responded with a more appropriate urban form that better reflects the type of inspirational environment for the university and its development partners.
- 2.4.36 The design builds upon the existing characteristics of the site and celebrates them. This includes a meaningful interaction with the 3 types of waterfronts surrounding this part of SA1, utilising the built infrastructure (both above and below ground), and improving general access to the area with a robust hierarchy of public open spaces, streets and development blocks. This is a marked change from the 2010 masterplan, which promoted a large leisure development that dominated the proposals.

- 2.4.37 An area of lesser change is along the southeastern edge of the Prince of Wales Dock. In addition to the on-shore marine space identified in 2010, the university will create a sports hub (the 'Health and Outdoor Education Hub') in the area, which will promote an outdoor leisure environment for both the university and the wider community. This will be supplemented with the provision of some student accommodation and car parking. The rest of Plot E remains as private residential as per the previous masterplan.

Responding to change during the process

- 2.4.38 Since the consultation draft masterplan concept was published on the 25th February, and responses generated during the 6 week consultation period (ending on the 8th April), a small number of masterplan revisions have been introduced. The first involves the reallocation of an illustrative building highlighted as having potential for student accommodation use to residential use. This in part responds to concerns raised by a small number of consultation respondents who queried the relationship and impact of student accommodation and residential development in the eastern end of the SA1 area.
- 2.4.39 The second change relates to the introduction of an additional (tall) residential building at the southern end of the SA1 peninsula. This responds to a number of points raised during and outside the consultation period: issues such as taking maximum advantage of the waterfront location for complementary partnership developments, references to City and County of Swansea Supplementary Planning Guidance which acknowledges that such buildings are acceptable in principle in this location (subject to other design and planning policies), the flexibility that the building would offer development partners and the as a stimulus to regeneration. The introduction of this building has been supported by a visual re-assessment as presented in the Environmental Statement Addendum.

Conclusions

- 2.4.40 A robust masterplanning methodology has been employed which focussed on three key stages of work: initial site analysis, strategic options and the development of the preferred option. Based upon a comprehensive evidence base, masterplanning principles were identified and considered. These in turn helped to shape a number of strategic options (10) which were distilled into shortlist of 5 which placed the university, as the catalyst for regeneration, in different locations around SA1. The merits or otherwise of each option, or alternative development scenario was addressed and a preferred strategy emerged which concentrated university activities along a western strategic corridor, running between the Technium Buildings in the north and the peninsula in the south, with the ability to extend sporting operations to the east.
- 2.4.41 At each stage of the process, potential alternative development scenarios have been considered in the context of whether each would meet, or potentially exceed, the requirements of the University, as both developer/occupier, and as regeneration facilitator.
- 2.4.42 Strategic options were refined into a composite alternative strategy which was considered by the University to best meet its own needs and the perceived needs of potential third party partners.
- 2.4.43 During the evolution of the preferred western corridor masterplan option stage, alternative and increasingly smaller scale revisions, continued to be identified and discussed within the University and with design stakeholder partners. This collaborative design approach, particularly with the Princes Foundation in respect of the Design Code, adds robustness to the process. The process of identifying, considering, discounting and refining alternatives has ensured that the masterplan can be presented as a deliverable, attractive and robust spatial framework and as the basis upon which the university can progress its project programming and attract inward investment via a prospectus, both feeding into a number of detailed reserved matters submissions in due course.

2.5. Scoping and Methodology

EIA Scoping

Scoping Opinion

- 2.5.2 In order to identify the issues to be considered as part of the Environmental Impact Assessment (EIA) and reported within this Environmental Statement (ES) a scoping letter was submitted to the City and County of Swansea on the 23rd December 2014.
- 2.5.3 The letter, volunteered in accordance with Regulation 13 of The Town and Country Planning (Environmental Impact Assessment) Regulations 1999 (the EIA regulations) (a copy of which is provided within Appendix 2.3 of this Report), identified the nature and scale of the project at that date.
- 2.5.4 The submission provided a project overview and background to the masterplan commission, the nature of the masterplan and its reference (and relevance to) a variation of condition application, the detailed planning history of the SA1 waterfront area and the planning policy framework against which development proposals will be assessed.
- 2.5.5 The Scoping opinion request included reference to the following potential effects considered appropriate for formal assessment purposes:
- Land Use and Soils
 - Geology and Contamination
 - Hydrology and Drainage
 - Traffic Highways and Access
 - Air Quality
 - Noise
 - Ecology
 - Landscape and Visual (Effects)
 - Archaeology
 - Waste and Recycling
 - Infrastructure and Utilities
 - Socio-Economic
- 2.5.6 The letter set out the nature of the potential impacts to be assessed as part of the EIA and outlined the proposed structure of the ES together with details of stand-alone reports/documents to be submitted with the application.

City and County of Swansea Adopted Scoping Opinion response.

- 2.5.7 The Council responded on 25th February 2015 and a copy is provided within Appendix 2.4.
- 2.5.8 The Council's response formally adopted the Scoping Opinion (and accompanying Transport Assessment Scoping Note), in accordance with Regulation 13 of the EIA regulations, subject to further comments provided by the Case Officer following the statutory consultation process.
- 2.5.9 A summary of the key comments is set out below although they are not repeated in their entirety.

Case Officer Assessment

- 2.5.10 The Case Officer's assessment is introduced with the acknowledgement that a Screening Opinion was not sought, but, had one been requested, it would have concluded that the project would fall within the scope of the EIA regulations by virtue of paragraph 10(b), namely that it would be an Infrastructure - Urban Development Project. This accords with the professional view of the authors of the Scoping Opinion.
- 2.5.11 Comments from the Case Officer, informed by statutory consultation, considered Traffic and Transport, Ecology, Flooding and Drainage, Landscape and Visual Impact Assessment, Cultural Heritage, Air and Noise Quality and finally Socio-economic impacts.

Reflection on the Adopted Scoping Opinion

- 2.5.12 As expected as part of the undertaking of a comprehensive EIA, details of the full adopted Scoping Opinion were circulated to the EIA Technical team for review. Where required queries were raised however, as no fundamental issues were raised which would impact on the scope of technical assessment work, it was considered that the EIA was able to continue as scoped.

Methodology

- 2.5.13 The EIA has been undertaken and the ES prepared in accordance with standard industry practices and follows the approach advocated by the Institute of Environmental Management and Assessment (IEMA).
- 2.5.14 Specific details of the approach are set out under the following headers.

Approach

- 2.5.15 The content of the ES Addendum is to be in the context of comparative assessments to that set out in the 2010 Environmental Statement Addendum (this replacing the original 2003 outline planning permission for the SA1 area.)
- 2.5.16 Notwithstanding this, each technical chapter of the 2015 ES Addendum follows the following, standard format:
- Introduction – scope of the chapter and nature of the impacts to be considered
 - Brief outline of policy and legislative context, where relevant to the specific topic under consideration
 - Methodology and assessment criteria;
 - Description of the baseline (existing) conditions;
 - Specific elements of the Proposed Development which are relevant to the topic;
 - Identification of the likely effects – in relation to construction and operational phases;
 - Evaluation & assessment of the significance of the effects identified (including positive effects);
 - Proposed Mitigation - Describe mitigation measures designed to reduce the environmental effects of the Proposed Developments;
 - Residual Effects - Effects after mitigation measures have been implemented; and
 - Identification of any further mitigation measures that could avoid, remedy or reduce the adverse effects.

Significance of Effects

- 2.5.17 The significance of the various effects identified will inevitably vary based on the subject. Some effects will be more measurable, for example traffic and transport, whereas others will be less so, for example cultural or community benefits.
- 2.5.18 An effect may be significant even though it may only have a minor impact and will be dependent on a number of factors:
- The extent and magnitude of the effect;
 - The duration of the effect (seasonal or short/long term);
 - Ability for the effect to be reversed;
 - Sensitivity of the receptor; and
 - How it measures against environmental quality standards.
- 2.5.19 Within this ES Addendum, levels of significance have been estimated (where appropriate) in accordance with topic related standard methodologies. The levels used are:
- Substantial;
 - Major;
 - Moderate;
 - Minor; or
 - Negligible (meaning that there is either no effect or that the significance can be considered to be negligible).
- 2.5.20 The effects of the proposed development are set out in a Summary of Effects Table which draws on the content of the technical chapters (6-14 inclusive); the table is included within Chapter 15.

3. Planning Context

3.1. Planning History

- 3.1.2 The SA1 area has been the subject of a detailed planning history stretching back to 1999. The following section provides a summary of the previous planning applications that have been granted with a specific focus on those relevant to the University's plans for the site.

1999 – 2002

- 3.1.3 A series of full planning applications were submitted by the Welsh Development Agency (WDA) and approved by City & County of Swansea Council (CCS) for development plots at the site. Approved developments included new business centres (Technium 1 and 2), offices for Morgan Cole and infrastructure works including new bridges, cycleways, footways etc.

June 2002

- 3.1.4 In June 2002 an outline planning application was submitted by the WDA (reference 2002/1000) for the wholesale redevelopment of the SA1 site including a mixed use development comprising employment (Use Class B1, B2) residential (C3), retail (A1), commercial leisure (D2), food and drink (A3), hotel (C1), and educational (D1/C3) uses, including associated infrastructure. The development was considered to be of a scale whereby an Environmental Impact Assessment was required in order to assess the developments significant impacts. Planning permission was granted in August 2003.

- 3.1.5 During the determination of the application a series of full planning applications for infrastructure works, changes of use and listed building consent applications were approved.

Post August 2003

- 3.1.6 Following the granting of outline planning permission for the site, full and reserved matters applications for some proposals contained within the masterplan were submitted and approved including applications for a new 116 bed hotel (Village Hotel), new offices (Langdon House and Cyprium) and residential developments (Altamar and South Quay).

- 3.1.7 In 2004 a variation of condition (Section 73) application was approved (2004/1801) to vary conditions from the 2003 site wide outline planning permission relating to extending the time period for the submission/review of phasing and development framework documents (Conditions 1 and 3).

May 2008

- 3.1.8 In May 2008 the most significant application to the current proposals was submitted. This was a variation of condition application (2008/0996) submitted by Welsh Government which proposed a series of changes to significant conditions including:

- 1) Phasing programme (condition 1)
 - 2) Land use masterplan (condition 2)
 - 3) Urban design framework (condition 3)
 - 4) Development capacity (condition 5); and
 - 5) Scale, nature, distribution and design of Class A3 and commercial leisure uses (Condition 7).
- 3.1.9 The application was supported by an Addendum to the original Environmental Statement and was approved in October 2010. The decision notice includes 36 conditions, including the following, which are of particular relevance:
- 1) Condition 2 - which refers to development according with Figure A2.1 within the Addendum Environmental Statement (April 2010); and
 - 2) Condition 5 - which states that the total development capacities for SA1 shall not exceed the Current Framework capacities detailed in Table A2.1 of the Addendum Environmental Statement (April 2010).
- 3.1.10 Figure A2.1 identified the type, distribution and scale of land uses on the site. Table A2.1 outlined the maximum extent of development for specific uses in each zone. Both are included in Appendix 3.1. Appendix 3.2 includes an overview of the plot by plot planning history of the site focusing on the key submissions.

3.2. Planning Policy Overview

- 3.2.2 This section provides an overview of planning policy relevant to the site and the development proposed.

National

- 3.1.1 Planning Policy Wales (PPW Edition 7, July 2014) is the Welsh Government's principal statement of national policy and sets out the land use planning policies that should be taken into account by local planning authorities in Wales and may be material to decisions on individual planning applications.
- 3.2.3 PPW requires decisions on planning application to ensure that "social, economic and environmental issues are balanced and integrated" as part of a presumption in favour of sustainable development.
- 3.2.4 PPW supports a preference for the re-use of previously developed land and Paragraph 4.4.3 states that decisions and proposals should "promote access to employment, shopping, education, health, community, leisure and sports facilities and open and green space, maximising opportunities for community development and social welfare".
- 3.2.5 Paragraph 2.4.4 requires local planning authorities to make provision in their development plans for land for higher education and other community facilities.
- 3.2.6 Paragraph 4.6.2 refers to regeneration and identifies mixed use development "comprising appropriate combinations of housing (including affordable housing), employment, retailing, education, leisure and recreation uses and open space" as an effective way to achieve such aims through a process of integrating communities.

- 3.2.7 Technical Advice Note 23 (TAN23) Economic Development (2014) provides guidance for local planning authorities on developing high level economic planning objectives and assessing the economic benefits of new development.
- 3.2.8 The guidance notes that economic development should contribute to all dimensions of sustainability and where economic development would cause environmental or social harm which cannot be fully mitigated careful considerations of the economic benefit will be necessary. To weigh up the benefits and impacts LPAs are required to adopt a qualitative, criteria based approach.

Technical Advice Note 23: Economic Development (February 2014)

- 3.2.9 The main objectives of the TAN are to encourage new economic development opportunities wherever possible in appropriate locations, rather than to prevent or discourage it. Although the provision of employment space is encouraged within the TAN, it also warns against that the oversupply of land within an area.

Regional/National Benefits

- 3.2.10 The strategic benefit at a regional, or even national importance of economic development is recognised by TAN 23, Para. 1.2.1, stating:

‘The economic benefits associated with development may be geographically spread out far beyond the area where the development is located. As a consequence it is essential that the planning system recognises, and gives due weight to, the economic benefits associated with new development.’

Economic Benefit and Sustainability / Environment

- 3.2.11 The balance between economic benefits and potential harm to the environment is an important consideration during the planning process. TAN 23 encourages local authorities and developers to think ‘positively and imaginatively’ and to seek a ‘win-win outcome’ where there is potential conflict between economic benefits of a proposal and possible social and environmental considerations. It is recognised at TAN 23, Paragraph 4.5.4 that in some cases the benefits of supplying employment land or development may outweigh the potential disadvantages/ adverse effects.
- 3.2.12 TAN23 identifies key questions to be considered when determining planning applications and allocations. These include the role of the proposal as being of “special Merit” – in essence, to what degree would the development make any special contribution to the policy objectives? Is the site a key element of a wider special strategy which aligns jobs, development and/ or infrastructure? Would the development bring ‘supply side benefits’ by raising skills and introducing innovation to the area?
- 3.2.13 For the reasons set out and amplified in this Chapter and throughout the Design and Development Framework Part 1 (The Planning Design and Access Statement), it is considered that the development proposal and masterplan is entirely consistent with the policy aspirations of TAN23 and the encouragement towards sustainable economic growth.
- 3.2.14 The current development plan relevant to the determination of a planning application at the site is the Swansea Unitary Development Plan (UDP, adopted November 2008). The same development plan that was in place at the time of the 2010 application is therefore currently still the most relevant policy document.
- 3.2.15 The site is allocated as part of the SA1 Waterfront mixed use development area. The site is identified to provide 18 hectares of employment land (Policy EC1 (2)) and 1500 dwellings (Policy HC1 (21)).

- 3.2.16 Policy EC2 of the UDP is considered to be the policy of most relevant to the revised development framework. This states that:

“A major redevelopment area is identified at SA1 Swansea Waterfront for mixed employment and residential development together with supporting leisure, tourism, community uses and ancillary services. The development of the site should:

- 1) Be comprehensive,
- 2) Integrate with the Maritime Quarter,
- 3) Complement and not compete with the City Centre,
- 4) Be of a high standard of design,
- 5) Embrace principles of sustainable development,
- 6) Provide high quality employment opportunities,
- 7) Increase the range of housing choice,
- 8) Make appropriate provision for a network of pedestrian and cycle routes, and
- 9) Safeguard the potential canal route corridor”.

- 3.2.17 Although the policy makes no explicit reference to education facilities, the 2010 planning permission reduced the amount of institutional/education floor space (compared to the original proposals) and therefore the 2015 revised development framework will reverse this trend.

- 3.2.18 Planning policy supports a range of employment uses on the site and therefore ancillary R&D and office development are likely to be supported in principle subject to their impact on uses previously proposed.

- 3.2.19 The site is also partly located within a hazardous installation consultation zone with Policy EV41 referring to not permitting development if there would be a significant health risk. The extant planning permission for the site is such that this issue is considered to have been resolved.

- 3.2.20 Once adopted the Swansea Local Development Plan will replace policies in the UDP. The Preferred Strategy (July 2014) sets out the broad approach that the LDP intends to take in order to ensure that the County is developed in a sustainable manner. The LDP is expected to be adopted in December 2016.

- 3.2.21 Referring to SA1, the Preferred Strategy states

“Further investment at SA1 Swansea Waterfront is needed in order to continue successful regeneration of the former dock area, whilst complementing the aims for City Centre regeneration”.

- 3.2.22 SA1 is also referenced in relation to employment opportunities and the Preferred Strategy notes that a cross boundary masterplan extending from SA1 through Swansea Port to the campus (Swansea University) and beyond is being prepared alongside the LDP.

- 3.2.23 The Preferred Strategy refers to SA1 as part of the ‘Urban Waterfront’ which is described as the “areas adjacent to the River Tawe and Swansea Bay within the main urban area of the County, including sites at the Tawe River corridor, SA1 Swansea Waterfront, Swansea Marina, and others adjoining Swansea Bay up to and including Mumbles”.

- 3.2.24 This combined area is referenced in respect to tourist facilities and paragraph 7.54 seeks development in the area to consider how they can maximise the benefits presented by other established waterfront developments already providing attractions and commercial operations for residents and visitors.
- 3.2.25 The Draft Proposals Map (2014) identifies the site within Strategic Site J “Fabian Way Corridor”. The Draft Concept Masterplan focuses on developing the vacant sites between the two Universities (Swansea and UWTSD) with complementary uses that do not compete with the regeneration of Swansea City Centre. The Masterplan also seeks to create a new spine street links Langdon Road to the main street of the Bay Campus. This opens up the intervening vacant sites for complementary uses that are urban in scale and active in nature
- 3.2.26 The urban waterfront is considered to be an ideal location to develop the city’s cultural and leisure facilities, offering attractions and facilities and increase levels of ‘City Break’ tourism.
- 3.2.27 The Strategy identifies the areas more likely to support tall buildings and includes the Swansea SA1 Waterfront, referring to the site as a unique opportunity on the waters edge and a major regeneration area.

4. Geology and Contamination Assessment

4.1 Introduction

- 4.1.1 This part of the Addendum ES reviews the changes to the proposed land uses at SA1 in the context of their relationship to geology and contamination. It also addresses the impacts that the proposed changes will have on receptors.
- 4.1.2 A full description of the Development is given in Chapter 2.3: Proposed Development. Details of the planning policy context of the Development are provided in Chapter 3: Planning Policy Background of this document.
- 4.1.3 This Chapter presents a summary of the legislation, policy and guidance relevant to the assessment. This is followed by details of the methodology used to establish the baseline conditions and undertake the assessment. The baseline conditions are then described, followed by an assessment of effects. A summary and conclusions section completes the Chapter.

4.2 Legislation

- 4.2.1 Legislation relevant to geology and contamination are set out below.
- 4.2.2 The Water Resources Act 1991 (as amended) (Ref 4-1) sets out the regulatory regime under which water abstraction and impounding is licensed by Natural Resources Wales (NRW).
- 4.2.3 The Environmental Protection Act 1990 Part IIA (Ref 4-2) requires local authorities to inspect their land from time to time in order to identify land that is posing unacceptable risks to human health or the environment. It provides the identification of such land as contaminated land and sets out the framework under which remediation may be required. In July 2013 the Welsh Government published Contaminated Land Statutory Guidance (Ref 4-3), which provides comprehensive information in relation to the risk assessment approach that local authorities are required to follow when inspecting land, as well as a detailed overview of the process that needs to be followed for the identification, determination and remediation of contaminated land. Guidance on apportioning liability between persons responsible for the presence of contaminants and the steps that the enforcing authority is required to take in order to recover the costs of any remediation action undertaken by it is also provided.
- 4.2.4 The Pollution Prevention and Control Act 1999 (Ref 4-4) provides for a unified system of environmental permitting. Within this, the Environmental Permitting (England and Wales) Regulations 2010 (as amended) (Ref 4-5) provide that the environmental permitting regime encompasses water discharge activities, groundwater activities, waste management activities and some activities associated with mines and quarries, including waste mining operations. An environmental permit is required for specified activities. Certain activities may benefit from an exemption from the environmental permitting regime, provided that they fulfil the conditions set by NRW.
- 4.2.5 Directive 2000/60/EC of the European Parliament (the Water Framework Directive (WFD)) (Ref 4-6) introduced a single system of water management across the European Union (EU), which is based on the principle of river basin management. In order to achieve the Directive's objectives Member States are required to identify 'River Basin Districts' (RBDs) and produce 'River Basin Management Plans' (RBMPs) for each of the respective RBDs.
- 4.2.6 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (Ref 4-7) implement the WFD in England and Wales. The Regulations identify the RBDs and the process that the responsible authorities for the implementation of the Directive should follow in order to produce the necessary RBMPs, identify bodies of water within each RBD which are used or intended to be used for the abstraction of drinking water and produce a register of 'protected areas' within each RBD.

4.3 Policy

- 4.3.1 Chapter 13 (Minimising and Managing Environmental Risks and Pollution) of Planning Policy Wales (2014) (Ref 4-9) deals with contaminated land and states *"The planning system should guide development to lessen the risk from natural or human-made hazards, including risk from land instability and land contamination. The aim is not to prevent the development of such land, though in some cases that may be the appropriate response. Rather it is to ensure that development is suitable and that the physical constraints on the land, including the anticipated impacts of climate change, are taken into account at all stages of the planning process. However, responsibility for determining the extent and effects of instability or other risk remains that of the developer. It is for the developer to ensure that the land is suitable for the development proposed, as a planning authority does not have a duty of care to landowners."*

4.4. Guidance

- 4.4.1 A number of standards and guidelines, which provide details of assessment methodologies and mitigation techniques, have also been referred to including:
- 4.4.2 The Pollution Prevention Guidelines (Environment Agency (EA), various publication dates) are a range of Pollution Prevention Guidance notes (PPGs) to advise industry and the public on legal responsibilities and good environmental practice. The EA no longer provides 'good practice' guidance and whilst PPGs have not been replaced, they can be considered still pertinent in the interim. Each PPG gives advice on law and good environmental practice, to help reduce environmental risks from business activities.
- 4.4.3 Control of Water Pollution from Construction Sites (CIRIA C532, 2001) (Ref 4-10) is a guidance document which provides practical help for consultants and contractors on how to plan and manage construction projects to control water pollution.
- 4.4.4 BS 6031 Code of Practice for Earthworks (British Standards Institute (BSI), 2009) (Ref 4-11) is a British Standard recommends a code of practice for earthworks forming part of general civil engineering construction. This standard describes methods of designing and constructing cuttings and bulk excavation. It also covers embankments and areas of general regarding in cut and fill as well as methods of excavating trenches, pits and shafts in various types of ground and methods of forming temporary supports to the sides.
- 4.4.5 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009) (Ref 4-12) has been developed to assist the construction sector to better protect the soil resources on construction sites. It sets out guidelines for pre-construction planning, soil management during construction and the re-use of soils for a variety of purposes, including habitat restoration.
- 4.4.6 Good Practice Guide for Handling Soils (Defra, 2000) (Ref 4-13) provides advice on soil stripping, the forming and taking down of soil storage mounds, and soil replacement operations using excavators, earth scrapers or bulldozers. There is also information provided on remedial works involving the removal of stones and damaging materials, and de-compaction during the replacement operations.
- 4.4.7 CL:AIRE The Definition of Waste: Development Industry Code of Practice (CoP) (2011) (Ref 4-14) provides best practice for the development industry to use when assessing if materials are classified as waste, or not, and determining when treated waste can cease to be waste for a particular use. The CoP provides engineers, contractors, consultants and developers a basis upon which to demonstrate to the Environment Agency (Natural Resources Wales) that they are following best practice with respect to the use and reuse of materials. It provides an auditable system to demonstrate that the CoP has been adhered to on a site by site basis. The development and use of the CoP is seen as a Better Regulation Approach by the EA (NRW).

4.5 Methodology and Assessment Criteria

- 4.5.1 The assessment of potential impacts on geology and contamination has consisted of a review of a Desk Study Report undertaken by Hyder during March 2015 (Ref 4–15), informed by published and internet-based information sources as well as a site walkover survey. Information obtained from the Coal Authority was collected relating to any coal workings on and within close proximity to the Development.

The Study Area

- 4.5.2 The study area has focused on the footprint of the Development itself which comprises 16 hectares in size and a radius of 250 m from the site boundary.

Temporal scope

- 4.5.3 The assessment considers the construction and operation phases of the Development.

Sources of Baseline Data

- 4.5.4 As part of this assessment various sources of information have been used and are detailed with the Phase 1 desk study which is included in Appendix 4.1.
- 4.5.5 These include historical maps, environmental database information, previous investigation reports and information obtained from Swansea City Council.

Significance criteria

- 4.5.6 The methodology for the assessment of effects on geology and contamination is based on Tables 4.1 to 4.3. The baseline conditions have been used to assess the importance of receptors as well as the magnitude of potential impacts from the proposed development.
- 4.5.7 In addition, a Conceptual Site Model (CSM) approach has been used to assess the risks posed by contaminants to receptors using a source, pathway and receptor model; based on the following:
- Source – potential source of contamination.
 - Pathway – means by which contamination can reach and impact upon a receptor.
 - Receptor – that which may be adversely affected by the presence of contamination.

Defining the importance/sensitivity of resource

- 4.5.8 After developing an understanding of baseline conditions, the significance of the identified impacts were determined based on the value (importance) of the receptor taking into account the magnitude of potential impact, in line with current best practice guidelines and water environment impact assessment criteria.
- 4.5.9 The value (importance) of the resource will be described using the guideline outlined in Table 4.1 below, developed from the Design Manual for Roads and Bridges (Ref 4-16).
- 4.5.10 Receptors considered within this assessment form the headings below in Table 4.1.

Sensitivity	Geology/Soils	Construction Workers	Site End Users and neighbours (operational workers)	Surrounding Land Uses	Controlled Waters (Groundwater / Surface Water)	Built Environment	Ecological Systems
High to Very High	Designated SSSI for geology/soils Grade 1 agricultural land. Land supports nationally rare plant species	Extensive earthworks and demolition of buildings	Residential, allotments play areas.	Greenfield sites / residential area	Principal aquifer or surface water in close proximity to site.	Listed buildings of high historical value.	Nationally or internationally designated sites.
Medium	Grade 2/3 agricultural land. Currently used for important crops. Land supports regionally/locally rare plant species.	Limited earthworks	Landscaping or public open space	Open space, commercial area.	Secondary aquifer	Buildings, including services and foundations.	Locally designated ecological sites.
Low (or Negligible)	Brownfield / industrial site. Site of little or no agricultural value.	Minimal ground disturbance	'Hard' end use (e.g. industrial car parking).	Industrial Area	No surface water bodies or aquifers close to the site.	N/A	No sites of ecological importance

Table 4.1 Defining Attribute Importance (Sensitivity) for Receptor

Methodology for Assessing Impacts

4.5.11 The magnitude of impact is based upon the contaminant linkage concept where each source-pathway-receptor would need to be present for an impact to be possible. It must be recognised that no ground investigation is exhaustive when identifying contaminated land, therefore the word “potential” has been used when considering contamination issues.

4.5.12 Table 4.2 provides the definitions of magnitude used for the purposes of this assessment.

Level of Magnitude	Criteria	Typical Example
Major	Results in loss of feature or attribute and/or quality and integrity of the feature or attribute	Geology: Loss of or extensive change to nationally important strata / complete loss of mineral resource. Human Health: Significant harm is likely to arise from an identified hazard at the site without appropriate remedial action. Controlled Waters: Loss in water body or permanent significant detrimental impact on water quality which permanently affects its use to or potential to supply water. Built Environment: Catastrophic damage to buildings/property. e.g. explosion resulting in building collapse.
Moderate	Results in loss of part of the feature or attribute and/or effect on the quality and integrity of feature or attribute	Geology: Loss of or major change to regionally important strata / significant loss of mineral resource. Human Health: It is possible that without appropriate remedial action, significant harm could arise to a designated receptor but it is relatively unlikely that any such harm would be severe and if any harm were to occur, it is likely that such harm would be relatively mild. Controlled Waters: Temporary loss of water body. Significant temporary detrimental impact on water quality but does not affect its use or moderate temporary detrimental impact on water quality, which does affect its use for supply purposes. Built Environment: Significant damage to buildings, structures and services.
Minor	Results in some measurable change to the feature or attribute quality and integrity	Geology: Minor loss or minor change to locally important strata/ partial loss of mineral resource. Human Health: It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that at worst this harm if realised would normally be mild. Controlled Waters: Moderate temporary detrimental impact on water quality, which does not affect its use for supply purposes Built Environment Damage to sensitive buildings, structures, services or the environment.
Negligible	Results in effect on feature or attribute, but of insufficient magnitude to affect the quality and integrity, or no effect	Geology: No or insignificant effect on strata. Human Health: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is likely to be mild or minor. Controlled Waters Minor temporary detrimental impact on water quality. Built Environment Easily repairable effects of damage to buildings, structures and services.

Source: Professional Judgement

Table 4.2: Criteria for assessing Magnitude of Impacts

- 4.5.13 The overall potential significance of the impact will then be defined using the matrix below in Table 4-3 which describes the relationship between the value of the resource (Importance of Receptor) and the magnitude of the potential impact (change).

		MAGNITUDE OF IMPACT			
		Negligible	Minor	Moderate	Major
SENSITIVITY/ IMPORTANCE	Very High	Neutral	Moderate	Large	Very Large
	High	Neutral	Slight / Moderate	Moderate / Large	Large / Very Large
	Medium	Neutral	Slight	Moderate	Large
	Low	Neutral	Neutral	Slight	Moderate

Table 4-3 Criterion for Determining the Significance of Effects

- 4.5.14 Only those effects that are shaded in Table 4-3 are considered likely significant effects with regard to the Town and Country Planning (Environmental Impact Assessment) EIA (England and Wales) Regulations 1999 (SI 1999 No 293) (as amended) (Ref 4-17).

Limitations of Assessment and Assumptions

- 4.5.15 This chapter has been compiled from a number of sources, which Hyder believes to be trustworthy. However, Hyder is unable to guarantee the accuracy of information provided by others. The chapter is based on information available at the time of writing. Additional information may become available in the future which may have a bearing on the conclusions of this chapter and for which Hyder cannot be responsible.

4.6 Description of Baseline Conditions

- 4.6.1 The baseline conditions for the site have been assessed with reference to information obtained as part of the Hyder Desk Study Report (Ref 4-15) attached as a technical appendix. This desk study contains information taken from the previous Environmental Statements for the site namely 2002 Wardell Armstrong Environmental Statement (WAES) (Ref 4-18) and Halcrow / Hyder Consulting (2010). Addendum Environmental Assessment (2010 AES) (Ref 4-19).
- 4.6.2 For ease of reporting in the Desk Study and to indicate the different types of use proposed in the development, the subject site has been split into three areas as follows ;
- Area A – The main focus of the proposed development revisions as set out in the 2015 Masterplan, namely the SA1 Waterfront Innovation Quarter “peninsula” site containing plots B5, B8 – B12 and C1 – C5 of original SA1 masterplan. (NGR 266700, 192700)
 - Area B – Sports hall, containing plot F of original SA1 masterplan. (NGR 267050, 192800); and;
 - Area C – Residential accommodation, containing plots original E6 – E9 of SA1 masterplan. (NGR 267300, 192820). It is noted that plots E6 - E9 within the original SA1 masterplan were designated for residential use which is consistent with the current proposed masterplan for this area.
- 4.6.3 The Areas are shown within Figure 4.1 below.



Figure 4.1. Site location plan and area designations

Site walkover information

- 4.6.4 A site walkover was carried out by a Hyder Geo-Environmental Engineer as part of the Desk Study.
- 4.6.5 The site boundaries comprise the Prince of Wales Dock to the north, Queens Dock and industrial areas to the east, Queens Dock and Ferry port to the south and the River Tawe to the west.
- **Area A** – Comprises three blocks of residential apartments adjacent to the Prince of Wales Dock. Kings Road connects these properties to the main residential properties north of the site. To the south of these properties are vehicle and marine vessel storage facilities which covers approximately a third of Area A. To the east, an enclosed tidal basin with no marine access is present. The remaining area of Area A consists of undeveloped flat bare ground with small patches of vegetation. Waste materials believed to have been fly tipped are present in the south.
 - **Area B** – An area of primarily flat bare ground with small patches of vegetation which is being used to store metal household appliances. Access to Area B was restricted.
 - **Area C** - Primarily consists of open grassland. A small pile of building rubble is present to the east alongside an area of made ground. To the north of the site is a gravelled area which contains vehicle garages and steel storage containers. Access to Area C was restricted.

Ground Conditions (Geology and Mining)

Geology

4.6.6 The geology of the site has been established as the following:

- *Superficial Deposits* - These areas are present within the site and comprise Blown sands (Area A) and Marine Beach Deposits across the remainder of the site areas B and C.
- *Solid Geology* – This consists of the Middle Coal Measures of Carboniferous age, generally comprising mudstone, sand and gravel.
- *Made Ground* – Due to the site's previous industrial history, made ground is present to varying depths. In the location of the former dry dock, made ground to a depth of 9.7m was encountered. Made Ground generally consisted of light yellowish brown sand, clayey gravel, coal waste, clinker, slag, bricks, concrete, cobbles and boulders.

4.6.7 Depths of strata were ascertained with reference to historic borehole data and previous ground investigation information. These strata depths are explained in detail within Sections 3.1.2 and 3.1.3 of the Hyder Desk Study Report (Ref 4-14) attached as Appendix 4.1.

4.6.8 The only sensitive land uses surrounding the site were identified as Crymlyn Bog; approximately 1.5km north east of the site. Crymlyn Bog has the following designations: Site of Specific Scientific Interest, Ramsar, Special Area of Conservation, and is a National Nature Reserve.

Mining

4.6.9 A review of information available from the Coal Authority website (Ref 4-20) and Coal and Brine Report (Ref 4-21) indicates that the site is not located within a past or present zone of physical influence from surface or underground coal workings. Coal reserves are present within the local areas which could be worked in the future, no licence has currently been issued.

Unexploded Ordnance (UXO)

4.6.10 With reference to Regional Unexploded Bomb Risk Maps provided by Zetica (Ref 4-22) the proposed development is indicated to be within an area denoted as a "High" bomb risk. These areas designated as high risk are those that have a high density of bombing hits (50+ bombs per 1000 acres) and abundant potential WWII targets.

4.6.11 The proposed development is located in close proximity to historical military strategic targets such as the Prince of Wales and Queens Docks, which would increase the risk of UXO being present. Therefore further assessment is required in relation to this risk. Notwithstanding this, the site has undergone extensive earthworks since WWII and therefore this risk is likely to already be understood / known.

Hydrogeology

4.6.12 The EA (now NRW in Wales) has designated aquifers according to their ability to yield water and the sensitivity of the aquifer to pollution. The geology and EA (NRW) aquifer designations underlying the proposed development are summarised in Table 4-5.

Geology		EA Aquifer Designation	Groundwater Vulnerability
Superficial Blown Sands		Unproductive	High
Marine Beach Deposits		Unproductive	High
Bedrock	Carboniferous Middle Coal Measures	Secondary A	High

Table 4.5: EA (NRW) Aquifer Designation and Groundwater Vulnerability

- 4.6.13 The site does not lie within a Source Protection Zone and there are no groundwater abstraction points within 1km of the site boundary.

Hydrology

- 4.6.14 The closest water bodies to the site are the Prince of Wales Dock directly north, Kings Dock directly east and Queens Dock to the south east. Swansea Bay is located directly south. Adjacent to the western side of the site is the River Tawe running north-west to south-east; which discharges directly into Swansea Bay.
- 4.6.15 The Tennant Canal runs from east to west; running through the nationally designated Crmlyn Bog and ends at Port Tennant approximately 1km north east of the site.
- 4.6.16 Under the River Basin Management plan the estuarine waters adjacent to the site are all of good ecological status and are predicted to remain good in 2015.

Site History

- 4.6.17 The site history of the site was established with reference to historical Ordnance Survey maps within the Hyder Desk Study (Ref 4-15). A summary of which follows:

The surrounding locale (off-site)

- Generally the surrounding areas of the proposed development were originally riverine mudflats along the River Tawe circa 1792, with significant dock developments between circa 1826 and 1859.
- Potential contaminative industries were established as a railway line transporting coppers and coal (circa 1874), and an Arsenic works, 250m east (circa 1884).
- Further significant development comprised The Prince of Wales Dock (1900), King Dock (1909) and Queens Dock (1920).

On site – Area A

- Area A was reclaimed circa 1900 and included railway sidings and buildings with a tidal basin which is connected to the Prince of Wales dock. The amount of railway sidings significantly increased in the western areas circa 1921. Buildings are now indicated as Tin Plate sheds.
- Circa 1951 a hydraulic power station is present in the south east and the lock between the tidal basin and the Prince of Wales Dock has been in-filled.
- Circa 1964, a dry dock was in-filled. In 1979 several depots are present.
- 2014 shows a residential property in the north western section.

On site - Area B and C

- Areas B and C were reclaimed circa 1884 with copper works and coal wharfs indicated. By 1921 engine houses previously shown in Areas B and C have now been removed and replaced with an electric generating station (Area B) with other unnamed buildings and railway tracks in Area C. The large copper works previously indicated in Areas B and C had been removed.
- Circa 1951 several additional railway lines are present in Areas B and C.
- Circa 1989 rail access to Areas B and C has stopped.

Contamination

- 4.6.18 With reference to Hyder Desk Study Report (Ref 4-15) there are several previous uses which could be potential sources of contamination such as railway lines / sidings, tin plate works, made ground and more details are provided in Table 4.1 in the Desk Study Report.

- 4.6.19 Previous investigations have been undertaken with Areas A, B and C. The results indicate that contamination (copper, zinc and PAHs) was identified within the southern part of Area A with hotspots of Sulphur, Lead, Cyanide and Sulphide noted.
- 4.6.20 Another investigation was undertaken on plot E6 on the eastern part of the site and this indicated elevated results of Arsenic, Barium, Lead and PAH compounds when compared to residential guideline values. These results were also compared to commercial guidelines and Lead and Benzo(a)pyrene were found to be elevated. Soil leachate results indicated PAH compounds were above the screening values. Groundwater samples were taken from across the investigation area and the contaminants of concern were identified as Barium, Benzene, Benzo(a)pyrene, Anthracene, and Fluoranthene.
- 4.6.21 Gas monitoring was undertaken in plots E6 and E9. Generally methane was not encountered in either of the plots, however a maximum concentration of 0.3% was recorded in a deep well in E6. Carbon dioxide was recorded in both plots with a maximum reading of 2.1% in plot E6. Based on the results observed a Characteristic Situation 1 (very low hazard potential) was determined for both plots.
- 4.6.22 Table 4-6 below describes the credible pathways by which sources could impact receptors.

End Users (operational workers/users)	Surrounding Land Uses	Construction Workers	Controlled Waters	Ecological Systems	Built Environment
Direct or indirect ingestion of contaminated soil (operational)	Inhalation or deposition of wind borne dust (construction stage)	Direct or indirect ingestion of contaminated soil (construction stage)	Leaching and migration of identified contaminants into controlled waters (operational and construction)	Phytoxic impacts on plant species and smothering of fauna with silt (operational and / or construction stage).	Chemical Attack of buried concrete structures and permeation of volatile compounds through plastic potable water supply pipes.
Concentration of flammable or asphyxiating in-ground gases in enclosed spaces (operational)	Migration of contamination in the sub-surface strata (including gases) (operational and / or construction stage)	Concentration of flammable or asphyxiating gases in confined spaces (construction stage)	Migration of dissolved gases	Toxic impacts on fauna (operational and / or construction stage)	Concentration of flammable or asphyxiating in-ground gases in enclosed spaces (operational)
Inhalation of harmful in-ground vapours indoors and outdoors (operational)		Inhalation of asbestos during ground works		Indirect impacts via contamination of water resources (operational and / or construction stage)	

Table 4.6: Potential Pathways of Land Contaminations

Receptors

- 4.6.23 With reference to the proposed development of a mixed use scheme as presented in the illustrative 2015 Masterplan, the receptors and associated importance are identified in Table 4-7 below.

Receptor		Importance	
Human Health	Proposed users of the development such as employees, residents and visitors	Low to Medium	Low assumes that the majority of the site will be covered with hard standing. Medium associated with soft landscape open space
	Residents already on site	High	Exposure to dust from construction work
	Construction Workers	High	Extensive earthworks
Controlled Waters	Surface Water – docks, tidal basin, River Tawe/Swansea Bay	High	Surface water bodies in close proximity to site
	Groundwater	Medium	Unproductive / Secondary aquifer
Built environment	Foundations / Utility Services	Medium	
Geology		Low	Brownfield / previous industrial land

Table 4-7 Associated Receptors

4.7 Changes to 2010 Outline Planning Permission

- 4.7.1 This addendum report is concerned with the changes to the outline planning permission relating to the end use of the parts of the development designated Areas A and B. The changes are identified within Section 4.6.2 of this chapter.

4.8 Identification of Likely Effects

- 4.8.1 This section identifies the potential effects on identified receptors during both the construction and operational phases of the development.

Construction Phase

Human Health – Construction Workers / Residents in close proximity

- 4.8.2 Historic sources of contamination have been identified within the subject site with credible pathways as identified within Table 4-6. During construction, earthworks and excavations activities are anticipated which will result in workers being exposed to potentially contaminated soils via dermal contact, accidental ingestion and inhalation pathways. Residents in nearby buildings could be exposed to contaminated dust via inhalation pathways.
- 4.8.3 It has been established that the proposed development lies within a high bomb risk area in close proximity to historic military targets i.e. the Docklands. Therefore a risk of encountering potential UXO during the construction works has to be considered until proven otherwise.

Surface Water and Groundwater

4.8.4 As was the case following the issuing of the 2010 decision notice replacing an earlier SA1 masterplan, during the construction phase a number of activities have the potential to effect changes in groundwater and surface water chemistry, which are outlined below:

- Removal of soil and earthworks associated with construction.
- Creation of stockpiles of soils and construction materials, with increased potential for the generation of runoff with elevated concentrations of sediment which may enter surface and groundwater bodies.
- The likely disturbance of the made ground during the construction has the potential to cause mobilisation of contaminants and leaching into surface and groundwater.
- Transportation, storage and use of oils / fuels and hazardous chemicals for construction plant and handling of wet cement and concrete, with increased potential for surface and groundwater contamination.
- The provision of temporary on-site sanitary facilities for construction site staff could introduce an additional source of pollution that is not currently present.
- A pathway to the groundwater could be created if piling is used within the construction of the proposed buildings on site.
- Dewatering may be required to remove water from excavations. This may cause migration of contaminants into the excavations if dewatering / pumping is undertaken for long periods of time.

Geology

4.8.5 During construction earthworks and excavations will take place which will cause the geology to be disturbed.

Operational Phase

Human Health (End Users)

4.8.6 Potential sources of contamination have been identified and elevated contaminants have been found from past investigations. The current layout design indicates that the majority of the site will be covered with hardstanding such as buildings / car parking. Hardcover will block the exposure pathway, such that a pollutant linkage is not formed. The emerging soft landscaping (green) elements of the public realm strategy results in the potential for site end users to be exposed to contaminated soils via dermal contact, accidental ingestion and inhalation pathways.

4.8.7 There is the potential of ground gases to be generated from Made Ground that is present within the site boundary. The gases have the potential to migrate into buildings and into confined spaces. Residents and maintenance workers could be exposed to such gases via inhalation.

Surface Water and Groundwater

- 4.8.8 Once construction has been completed, the majority of the site will be covered with hardstanding reducing the potential for infiltration and leaching of contaminants within the underlying soils. In the areas of soft landscaping if the soils are left exposed then some surface runoff may occur into surface water features and leaching / migration of contaminants into groundwater.

Structures and Services

- 4.8.9 Any potential contamination remaining within the underlying soils could cause damage to structures and especially underlying services such as water service pipelines. In the long term this could cause structural damage to pipes/foundations.

4.9 Evaluation and Assessment

Construction Phase

Human Health – Construction Workers / Residents on Site

- 4.9.1 With reference to Table 4-1 and Table 4-2, it is considered that there would be a moderate magnitude of impact from contaminated soils and UXOs upon a high sensitivity receptor (construction workers / residents on site) during construction. Therefore with reference to Table 4-3 this could cause a moderate / large significance of effect if mitigation measures are not implemented. See Section 4.10.

Surface Water and Groundwater

- 4.9.2 With reference to Table 4-1 and Table 4-2, it is considered that there would be a moderate magnitude of impact upon a medium (groundwater) receptor during construction which could lead to a moderate significance of effect according to Table 4-3 if mitigation measures are not implemented. See Section 4.10.
- 4.9.3 With regards to surface water receptors which are considered to be of high importance, a moderate magnitude of impact could lead to a moderate / large significance of effect if mitigation measures are not implemented in accordance with Table 4-3. See Section 4.10.

Geology

- 4.9.4 The geology across the site is considered to be of low importance and the construction activities are considered to be of negligible impact. This would lead to a neutral significance of effect in accordance with Table 4-3.

Operational Phase

Human Health (Site End Users)

- 4.9.5 If mitigation measures are not implemented during the construction phase, it is considered that site end users considered to be due to the nature of the proposed development would be exposed to a minor magnitude of impact from contaminated soils resulting in a neutral to slight significance of effect.
- 4.9.6 With regards to the risk from ground gases (explosion / asphyxiation), this would be considered to be a major magnitude of impact resulting in a large to moderate significance of effects.

Surface Water / Groundwater

- 4.9.7 As the site will be mainly covered with hardstanding during the operational phase of the development, the magnitude of impact to surface water (high importance) and groundwater (medium importance) would be minor. This would result in a slight / moderate significance of effect with regards to surface water and a slight significance of effect with regards to groundwater using Table 4-3.

Structures and Services

- 4.9.8 The presence of contamination being present within areas of the site means there is potential for damage to foundations and services via direct contact with contaminated soils.
- 4.9.9 The risk associated with this has been assessed as a moderate magnitude of impact on a receptor of medium sensitivity. With mitigation measures not being implemented, this would lead to a moderate significance of effect.

4.10 Proposed Mitigation

- 4.10.1 The proposed mitigation set out below has taken into consideration that which was captured in the 2010 decision notice resulting from the last variation of condition application, and have been updated accordingly.
- 4.10.2 The potential impacts to construction workers from contaminants in soils and groundwater will be mitigated through the adoption of appropriate health and safety practices, as outlined in the Code of Construction Practice (CoCP).
- 4.10.3 All persons engaged in site construction works will be made aware of the findings of the intrusive investigations and the hazards associated with handling potentially contaminated materials. All works will be conducted in accordance with The Construction (Design and Management) Regulations 2015 (CDM 2015) and appropriate PPE will be adopted during the construction works.
- 4.10.4 Where any hazardous chemicals are used in the construction works, risk assessments will be made under The Control of Substances Hazardous to Health Regulations (as amended) (Ref 4-23).
- 4.10.5 Intrusive investigations will be undertaken across the development area, to obtain current information on the land quality of the underlying soils. The chemical results will be assessed using current guidelines to determine the level of remediation that is required to make the site suitable for the proposed end use.
- 4.10.6 Gas monitoring will be undertaken prior to construction to determine the gas regime on the site and the appropriate gas protection measures that are required in the proposed buildings on the site.
- 4.10.7 The risk from UXOs will be investigated and appropriate mitigation measures such as magnetometer surveys will be adopted if considered necessary.
- 4.10.8 The procedures relating to the monitoring of excavation works and the identification of any suspected further contamination defined within the CoCP will be adhered to. Site workers will remain vigilant to the possible risk of encountering isolated areas of contaminated material, particularly if unusual visual changes, or odours are encountered.
- 4.10.9 The main contractor will be required to develop contingency plans in the Construction and Environmental Plan (CEMP) to minimise accidental exposure to human and environmental receptors from unexpected hazards.
- 4.10.10 A Materials Management Plan will be produced detailing the strategy for re-use of soils within the proposed development. This will follow the approach within the CL:AIRE Development Industry Code of Practice (Ref 4-14).
- 4.10.11 Suitable measures to mitigate the contamination impacts during the construction works are outlined below. The following mitigation methods will be employed:

- Prevention of water entering excavations, where possible;
- Planned and phased excavation and stockpiling operations to ensure minimal disturbance;
- Use of measures such as cut off ditches or impermeable membranes to prevent uncontrolled release of runoff from excavations, stockpiles or exposed ground;
- Appropriate disposal of waste from the Site;
- Appropriate storage of potentially polluting materials and chemicals in accordance with the Control of Pollution (Oil Storage) Regulations (England) 2001 (Ref 4-24);
- Adequate supervision of all deliveries and refuelling involving potentially polluting substances;
- Delivery and refuelling areas to be located away from surface water bodies with adequate measures in place to contain spillages at these locations;
- Leaks or spillages of potentially polluting substances to be contained, collected then removed from site in an appropriate manner e.g. use of absorbent material, bunding or booms. An emergency action plan will be formulated which all Site personnel will have read and understood;
- Storage of machinery and equipment to be located away from surface water bodies. Drip trays to be placed underneath any parts where oil/fuel may be found;
- Use of adequate wheel wash facilities to contain and dispose of potentially polluted runoff;
- Regular washing of machinery and access roads and dampening to reduce dust emissions with appropriate collection and disposal of runoff;
- Dust suppression to reduce risk to onsite residents;
- Use of pre-mixed concrete from an off-site source or limiting mixing and handling of wet concrete to a designated area away from surface water bodies and with controlled runoff for appropriate disposal;
- Should areas of contamination be identified measures will be taken to ensure that contaminated material is isolated. All equipment utilised within the contaminated area will be thoroughly cleaned before it is used outside the contaminated area;
- Special measures will be adopted during piling to ensure that preferential pathways are not created, a piling risk assessment will be undertaken if required;
- All construction works will be carried out in accordance with PPG 6 'Working at Construction and Demolition Sites' (Ref 4-25) and other relevant PPG documents;
- Secure access to the Site for construction personnel only to prevent vandalism; and
- Any dewatering works for construction would take place prior to the placement of concrete and no subsequent dewatering would occur until any concrete has sufficiently cured to prevent runoff of cement grout, unless the discharge is appropriately treated.

4.11 Residual Effects

- 4.11.1 This section assesses the effects of the Development taking into consideration the provision of the mitigation measures presented in Section 4.10.

Construction Phase

Human Health – Construction Workers / Residents on Site

- 4.11.2 When the above mitigation measures are considered, the magnitude of impact to construction workers and on site residents from contaminated soils and UXOs during the construction phase is considered to be Minor. Using Table 4-3, this would lead to a Slight / Moderate significance of effect. With regard to the EIA Regulations (Ref 4-17), this effect would be considered **Not Significant**.

Surface Water and Groundwater

- 4.11.3 When the above mitigation measures are considered, the magnitude of impact to surface water and groundwater is considered to be Minor. This would lead to a Slight / Moderate significance of effect with regards to surface water and a slight significance to groundwater receptors. With regard to the EIA Regulations (Ref 4-17), this effect would be considered **Not Significant**.

Operational Phase

Human Health – Site End Users

- 4.11.4 Appropriate remediation of contamination will be undertaken during the construction phase as detailed in the mitigation measures above. The Development would therefore have a Negligible magnitude of impact on a receptor of high sensitivity, resulting in a Neutral significance of effect using Table 4-3. With regard to the EIA Regulations (Ref 4-17), this effect would be considered **Not Significant**.

Surface Water / Groundwater

- 4.11.5 There is not anticipated to be any changes to groundwater or surface water chemistry during the operational phase of the development if appropriate UK guidance for contaminated land and groundwater is adopted during the construction phase. As no changes are anticipated in the groundwater quality, it is considered that the Development would have a Negligible magnitude of impact on a receptor of Medium or High sensitivity, resulting in a Neutral significance of effect. With regard to the EIA Regulations (Ref 4-17) this effect would be considered **Not Significant**.

Structures and Services

- 4.11.6 With mitigation measures implemented the potential effect upon structures and services have been assessed as a negligible magnitude of impact on a receptor of medium sensitivity, this would result in a neutral significance of effect. With regard to the EIA Regulations (Ref 4-17), this effect would be considered **Not Significant**.

4.12 Further Mitigation Measures

- 4.12.1 No further mitigation measures are proposed.

4.13 Cumulative Impacts

- 4.13.1 No significant impacts have been identified in relation to geology and contamination as a result of the proposed scheme.
- 4.13.2 No cumulative impacts are anticipated.

4.14 Summary of Effects Table

- 4.14.1 This Chapter has considered the effects of the Development during the construction, and operation phases on ground conditions from contamination, on surface water, groundwater and human health receptors. Table 4-8 provides a summary of the potential effects of the Development, the mitigation to be implemented for any potentially significant effects and the consequent residual effects.

Potential Effect	Phase*	Significance Prior to Mitigation	Mitigation Measures	Residual Effects
Human Health				
Contaminated Soils / UXOs	C , O	Moderate / Large	Investigation / best practice / Remediation / CEMP	Not Significant
Ground Gases	O	Moderate / Large	Investigation / gas protection measures	Not Significant
Controlled Waters				
Changes to water quality (mobilisation of contaminants / spillages / run off / creation of pathways)	C,O	Moderate to Moderate / Large	Investigation / best practice / Remediation / CEMP	Not Significant
Buildings				
Contaminated Soils	O	Moderate / Large	Investigation / best practice / Remediation / gas protection measures / CEMP	Not Significant
Geology				
Construction Activities	C	Negligible		
* - C = Construction, O = Operational,				

Table 4.8: Summary of Potential Effects, Mitigation Measures and Residual Effects

4.15. References

- 4.15.1 Ref 4-1 UK Government (1991) The Water Resources Act (as amended).
- 4.15.2 Ref 4-2 UK Government (1990) Environmental Protection Act.
- 4.15.3 Ref 4-3 Welsh Government (2012) Contaminated Land Statutory Guidance.
- 4.15.4 Ref 4-4 UK Government (1999) Pollution Prevention and Control Act.
- 4.15.5 Ref 4-5 UK Government (2010) Environmental Permitting (England and Wales) Regulations (as amended).
- 4.15.6 Ref 4-6 European Parliament (2000) Directive 2000/60/EC, Water Framework Directive.
- 4.15.7 Ref 4-7 European Parliament (2003) Water Environment Regulation, Water Framework Directive.
- 4.15.8 Ref 4-8 National Planning Policy Framework (NPPF) (2012)
- 4.15.9 Ref 4-9 Welsh Government, Planning Policy Wales (2014)
- 4.15.10 Ref 4-10 CIRIA C532 (2001) Control of Water Pollution from Construction Sites.
- 4.15.11 Ref 4-11 British Standard (BS) (2009) 6031 Code of Practice for Earthworks.
- 4.15.12 Ref 4-12 UK Government (2009) Defra - Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
- 4.15.13 Ref 4-13 UK Government (2000) Defra - Good Practice Guide for Handling Soils.
- 4.15.14 Ref 4-14 CL:AIRE The definition of Waste: Development Industry Code of Practice (CoP) (2011)
- 4.15.15 Ref 4-15 Hyder Consulting, (2015) University of Wales Trinity St David, Phase 1 Geo-Environmental Desk Study Report, SA1 Waterfront. Report no 5012-UA007194-UP31-01
- 4.15.16 Ref 4-16 Highway Agency (2009) Design Manual for Roads and Bridges.
- 4.15.17 Ref 4-17 UK Government (1999) Country Planning (Environmental Impact Assessment) (England and Wales) Regulations (SI 1999 No 293).
- 4.15.18 Ref 4-18 Wardell Armstrong (2002), Port Tawe Innovation Village, Environmental Statement.
- 4.15.19 Ref 4-19 Hyder, Halcrow (2010), SA1 Swansea Waterfront, Addendum Environmental Statement.
- 4.15.20 Ref 4-20 The Coal Authority Interactive website (2015)
- 4.15.21 <http://coal.decc.gov.uk/en/coal/cms/publications/data/map/map.aspx>.
- 4.15.22 Ref 4-21 Coal Authority, (2015) National Coal Mining Report
- 4.15.23 Ref 4-22 www.zetica.com

- 4.15.24 Ref 4-23 Health and Safety Executive, The Control of Substances Hazardous to Health Regulations (as amended) (2004)
- 4.15.25 Ref 4-24 DEFRA, The Control of Pollution (Oil Storage) Regulations (England) 2001.
- 4.15.26 Ref 4-25 Environment Agency, PPG 6 'Working at Construction and Demolition Sites'

5. Hydrology and Drainage

5.1. Introduction

- 5.1.1 The background hydrology of the Revised SA1 Masterplan site has not materially changed since the 2002 WAES, 2006 FCA and the 2010 AES other than the infill development of the identified plots and partial completion of the proposed drainage and highway network.

5.2. Baseline Conditions

- 5.2.1 The areas within revised SA1 Masterplan, Swansea Waterfront which are proposed for the new development are the former Swansea Port land and are generally levelled and prepared with hardcore or made ground to accommodate future development.
- 5.2.2 Plots E-F are located between the Kings Dock to the south and the Prince of Wales Dock to the north. The Peninsular site is located with the River Tawe and Swansea Marina to the west. The River Tawe is impounded by a control barrage which incorporates a vessel and fish pass.
- 5.2.3 To the east of the peninsular site a tidal basin has been constructed as part of the overall SA1 development. There are proposals for this to form a potential future link to the Prince of Wales dock. The Prince of Wales dock is currently part of the Associated British Ports (ABP) operational docks.

5.3. Hydrology & Flood Risk

- 5.3.1 The 2006 Flood Consequence Assessment (FCA) identifies that fluvial flooding from the River Tawe is significantly reduced due to the impounding of the mouth of the river and the control of river levels this allows adjacent to the western boundary of the site. The dominant flood risk to the proposed site is tidal flooding from the Severn Estuary. There are currently no sea defences along this section of coastline.
- 5.3.2 The Environment Agency (EA) (National Resources Wales (NRW)) have previously commented that a minimum development floor level of 6.58m AOD should be adopted. However, since the 2006 FCA, new extreme water levels estimates have been produced for the UK. These new estimates are detailed in the EA's report on the Coastal Flood Boundary Conditions for UK Mainland and Islands (EA, 2011).
- 5.3.3 In consultation, NRW have confirmed that they do not have any fluvial flood estimates for the site.
- 5.3.4 The latest extreme water levels at the mouth of the River Tawe (Node 488) (6.15m AOD T200 year and 6.39m AOD T1000 year) were obtained from the EA's report (EA, 2011).
- 5.3.5 These extreme water levels, based on 2008 data, were raised to include the predicted rise in sea levels as a result of climate change for development lifetimes of 75 (commercial) and 100 years (residential). The predicted rises in sea levels are presented in Table 5-1. These are based on the climate change projections published in Defra's FCDPAG3 Economic Appraisal Supplementary Note (Defra, 2006).

Period of Time	75 year (2090)	100 year (2115)
2008-2025 (3.5mm/yr)	59.5mm (17 years)	59.5mm (17 years)
2026-2055 (8.0mm/yr)	232mm (29 years)	232mm (29 years)
2056-2085 (11.5mm/yr)	333.5mm (29 years)	333.5mm (29 years)
2085-2116 (14.5mm/yr)	58mm (4 years)	420.5mm (29 years)
Cumulative increments	683mm	1045mm

Table 5.1 Predicted Rise in Sea Level

- 5.3.6 Table 5.2 below presents the resultant design tide heights that have been derived for the site.

Design Event	T200 year (2090) flood	T1000 year (2090) flood	T200 year (2115) flood	T1000 year (2115) flood
Design Life	75 years		100 years	
Adjusted tide heights	6.83mAOD	7.07mAOD	7.20mAOD	7.44mAOD
95% Confidence Bound	+/- 0.30m	+/- 0.5m	+/- 0.30m	+/- 0.5m
Adjusted tide heights with + 95% Confidence Bound	7.13mAOD	7.57mAOD	7.50mAOD	7.94mAOD

Table 5.2 Extreme Tide Predictions

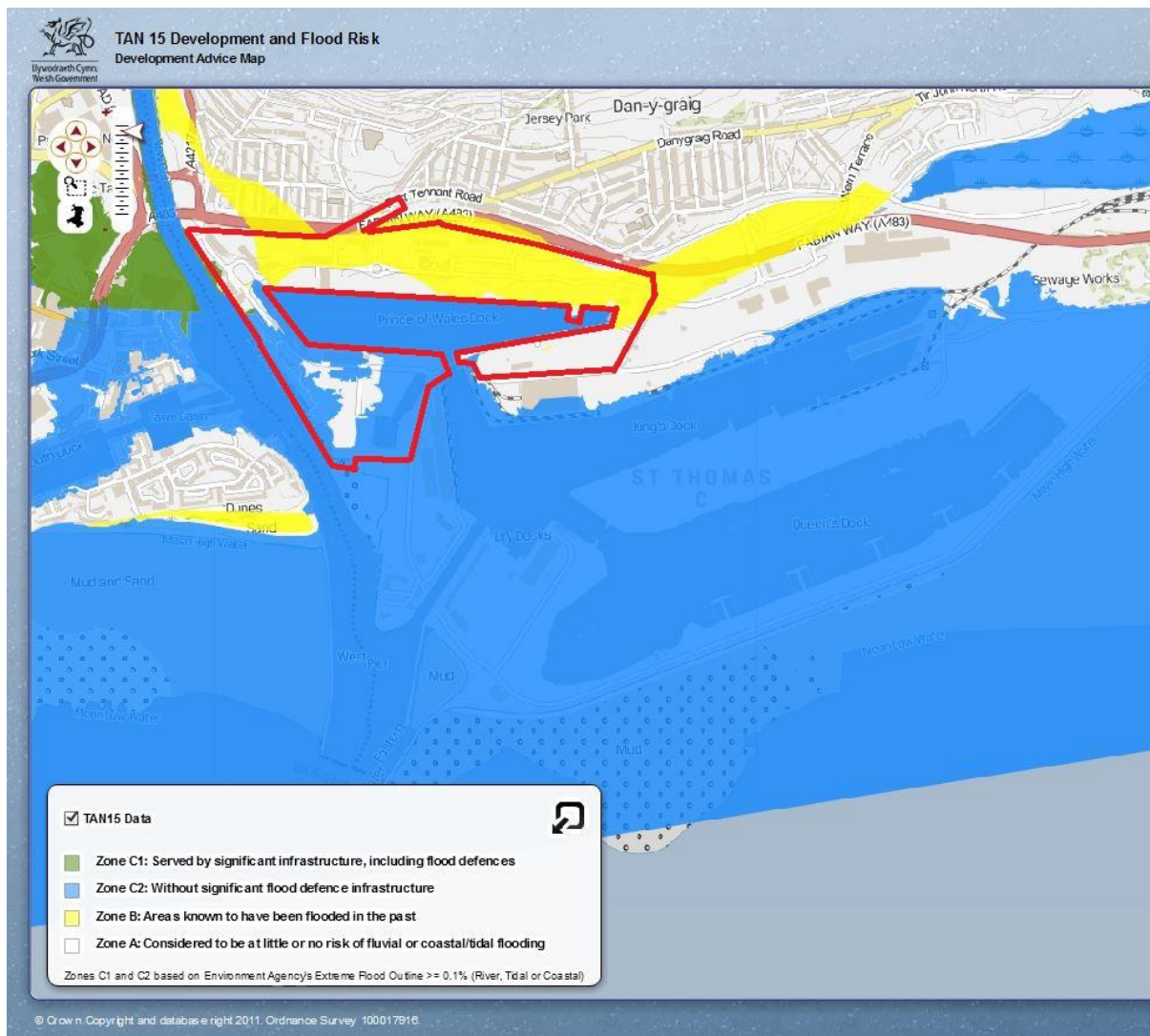
- 5.3.7 In line with NRW guidance (which stipulates that 95% Confidence Bound should be included), for commercial development the finished floor level would need to be set at a minimum of 7.13m AOD and for residential development the finished floor level would need to be set at a minimum of 7.50m AOD. By adopting these levels the TAN15 coastal threshold and consequences and NRW guidelines would be met.
- 5.3.8 Basement or undercroft parking would be susceptible to flooding for levels below 7.94m AOD and suitable non-habitable uses with pumping facilities would be necessary. Where possible access roads to undercroft parking should have an optimum level 7.94m AOD to prevent the likelihood of flooding in extreme events.

5.4. Cumulative Effects

- 5.4.1 The potential development of Swansea Bay Tidal Lagoon will have a neutral or marginally beneficial effect on the proposed SA1 development. The lagoon proposals will introduce an increased resilience to surge tides from the Severn Estuary once completed by providing a seawall between the Severn Estuary and the SA1 development.

5.5. Flood Consequences for Development

- 5.5.1 The 2006 FCA has shown that most of the site is likely to be at risk from flooding with almost the entire site being in Zone C2. The proposed development satisfies the justification criteria in TAN 15 and the addendum for highly vulnerable development (education/residential).



Extract 5.1: TAN 15 Development Advice Map (DAM)

- 5.5.2 The site is accessed via Kings Road to the west and Marine Road/Langdon Road to the east and these roads satisfy the minimum requirements for flood evacuation routes being above the T200 flood level and no less than 0.3m below the T1000 flood level. Any basements or undercroft car parking would need to be designated for suitable use in view of the flood risk with appropriate drainage facilities provided.
- 5.5.3 Once the proposed development has been constructed the potential consequences of fluvial and tidal flooding on site have been considered and in terms of TAN 15 and NRW guidance, have been found to be acceptable.

5.6. Surface Water Drainage

- 5.6.1 The surface water drainage strategy for the existing SA1 development comprises separate highway and plot drainage systems with outfalls into the Prince of Wales Dock. Plots bounding the River Tawe also discharge directly to it via dedicated plot drainage systems.
- 5.6.2 The existing drainage infrastructure shown in Figures 5.1 to 5.4 would be utilised to serve the Revised SA1 Masterplan. The drainage network would be supplemented by new piped connections and outfalls to provide an adequate surface water drainage system for the development.
- 5.6.3 Due to the made ground and potential risk from contamination, infiltration drainage SuDS systems are not suitable and separation of surface water from paved areas or roofs from groundwater would be necessary.
- 5.6.4 Surface water flows would be discharged directly from the site into the Prince of Wales dock or the River Tawe and would not require attenuation. However, outfall levels would ideally need to be positioned above high tide levels in the Tawe and high water levels in the Prince of Wales dock to prevent a “tide locking” scenario. In the event that lower outlet levels are necessary, adequate storage capacity could be built into the system through tanks or oversized pipes. This will be determined at detailed design.

5.7. Water Quality

- 5.7.1 Suitable oil separators are required to intercept flows from trafficked areas within the plots to ensure good water quality in the discharges surface water. Drainage from roof areas would also be kept separate as far as is practicable and would not require treatment through oil separators.
- 5.7.2 Ground conditions are generally unsuitable for infiltration drainage and through separation of surface water flows from groundwater this would provide some improvement in overall water quality compared to the existing conditions. Suitable SuDS features could be incorporated into the soft landscape features but these would need to be separated from ground water with a liner to prevent infiltration and leaching of existing contaminants.
- 5.7.3 The proposed development will provide an impermeable barrier of tarmac/concrete over the vast majority of the site, which at present has areas where run-off can permeate into the ground leaching the existing contaminants into the water table. The capping of the site with an impermeable layer will prevent this leachate occurring and improve water quality by reducing the amount of leachate flowing into the water table.

5.8. Foul Water Drainage

- 5.8.1 The foul drainage strategy comprises of piped gravity system within Kings Road and Marina Road / Langdon Road with spurs from each development plot. The existing foul network discharges to drop shafts on the existing Dwr Cymru Welsh Water (DCWW) deep sewer which lies below Langdon Road that connects to Swansea Waste Water Treatment Works (WWTW) to the east.

- 5.8.2 The existing SA1 development has Water Industry Section 106 discharge consents in place and together with the adoptable foul drainage network it is intended to provide for fully serviced development plots.
- 5.8.3 Due to site levels and the lengths of drains required, the gravity sewer network serving the Peninsular site will require a pumping station and associated storage tanks to enable connection to the public sewer network. The pumping station and storage tanks have already been constructed and are subject to a Section 104 Agreement.
- 5.8.4 An assessment of the foul flow from the development has been prepared based on the population of the Revised SA1 Masterplan and a new piped foul drainage network would be required to serve the Peninsular area but no improvement works would be required to the existing as-built foul drainage system as a result of the proposed connections.
- 5.8.5 The sports hall and residential developments for Plots E-F would connect to a new gravity foul sewer in Marina Road. Dependent on the final layout of Plot F, it may be necessary that a private pumping station is required to connect to the foul drainage network because of the distance from the connection to the extreme western end of the plot.
- 5.8.6 Using the Revised SA1 Masterplan floor areas, foul discharge calculations have been produced using the DCWW Sewerage Design Manual v2.1. The calculations show a peak foul discharge rate which have been summarised in the table below; these flows will be accommodated within the existing foul sewer network and storage without the need for any major alterations, from the previously submitted 2010 AES.

Site	Peak Flow Discharge Rate
	(l/s)
Proposed SA1 Development	12.78
Plots E & F	4.22

Table 5.1: Peak foul discharge rates, using DCWW Sewerage Design Manual v2.1

- 5.8.7 The above surface water and foul water drainage strategy for the Revised SA1 Masterplan follows the previous strategy from the 2010 AES and will have no major impact on the drainage network for the SA1 development.

5.9. Conclusions

- 5.9.1 A viable drainage strategy as set out within the Design and Development Framework Part 1: The Planning Design and Access Statement in separate piped systems for roof and yard drainage, discharging to the Prince of Wales Dock or River Tawe. Highway drainage will also discharge to these locations but will pass through oil separators. Foul drainage for the development will connect to the existing public sewer through gravity drains or pumping station depending on the location of available connection points that provides a framework for the development of surface water management systems for the site and a foul sewerage network to service the new development.
- 5.9.2 Due to the potential for spreading existing ground contamination, infiltration SuDS features have not been used on this development.
- 5.9.3 The existing infrastructure on the SA1 site provides for serviced development plots with connections to adoptable highways. The primary road links contain foul drainage together with spurs for plot drainage and other utilities contained within the footways.
- 5.9.4 The background hydrology of the revised SA1 Masterplan site has not materially changed since the 2010 AES other than the infill development of the identified plots and partial completion of the proposed drainage and highway network. The proposals for the new fit within the previously established framework and do not introduce any new impacts.

- 5.9.5 Once the proposed development has been completed the potential consequences of fluvial and tidal flooding on site have been considered and in terms of TAN 15 and NRW guidance, have been found to be acceptable.
- 5.9.6 Refer to Appendix 5.1 for plans.

6. Transport and Access

6.1. Introduction

- 6.1.2 This Chapter presents information on the effects of the Development on transport and access receptors. The Development is the SA1 Waterfront Innovation Quarter Masterplan 2015 as compared to the consented 2010 Masterplan.
- 6.1.3 A full description of the Development is given in Chapter 2: Introduction.
- 6.1.4 This Chapter describes the methodologies used to assess the potential significant effects of the Development. Details of scoping consultations are provided. Baseline conditions are discussed, and potential effects described, followed by details of mitigation measures and an assessment of residual effects. A summary of the assessment and conclusion is then provided.

6.2. Legislation, Policy and Guidance

- 6.2.1 An outline of the legislation, policy and guidance relevant to the Development at the national, regional and local level is provided below.

Policy

National Policy

- 6.2.2 At a Wales national level, key policies are contained within Planning Policy Wales 7th Edition (PPW) (Welsh Government, 2014) (Ref 6-1) and Technical Advice Note 18: Transport (TAN 18) (Welsh Government, March 2007) (Ref 6-2).
- 6.2.3 PPW sets out the land use planning policies of the Welsh Government and advises in paragraph 8.7.1 that, when determining a planning application for development that has transport implications, local authorities should take the following into account:
- The willingness of a developer to provide infrastructure or measures to manage traffic, to overcome transport objections to the proposed development;
 - The environmental impact of both transport infrastructure and the traffic generated; and
 - The effects on the safety and convenience of other users of the transport network.
- 6.2.4 At paragraph 8.7.2, PPW advises that Transport Assessments are an important mechanism for setting out the scale of anticipated impacts a proposed development is likely to have. They assist in helping to anticipate the impacts of development so that they can be understood and catered for. PPW lists the categories of development that the Welsh Government expects to be accompanied by a Transport Assessment.
- 6.2.5 TAN 18 (Ref 6-2) sets out how land use and transport planning should be integrated and how transport impacts should be assessed and mitigated. TAN 18 states that Transport Assessments should be incorporated into Environmental Statements where the transport impacts of an application are 'significant' within the scope of the Town and Country Planning (Environmental Impact Assessment (England and Wales) Regulations (SI 1999 no.293).

Regional Policy

- 6.2.6 The Joint Transport Plan for South West Wales (2015) (Ref 6-3) provides the framework for improving connectivity to, from and within the region for the period 2015 – 2020. The plans vision is 'to improve transport and access within and beyond the region to facilitate economic regeneration, reduce deprivation and support the development and use of more sustainable and healthier modes of transport'. Objective 2 within the plan aims 'To improve access for all to a wide range of services and facilities including employment and business, education and training, health care, tourism and leisure activities.

Local Policy

- 6.2.7 The Development is located within the City and County of Swansea (CCSC) Local Authority. The City and County of Swansea Unitary Development Plan (UDP – 2008) (Ref 6-4) for the period to 2016 sets out the policies and proposals for the future development and use of land and environmental conservation within Swansea. Policy AS1 states that new development 'should be located in areas that are currently highly accessible by a range of transport modes, in particular public transport, walking and cycling, or in areas where a good level of such provision can realistically be achieved'.
- 6.2.8 Policy AS1 also states that 'in considering new development proposals, the need for Transport Assessments and Travel Plans will be assessed, taking account of:
- The scale and nature of the development;
 - The level of employment/and associated travel demand;
 - Visitor generation;
 - Delivery/service vehicle movement;
 - Operational hours; and
 - Possible future travel demand.

Guidance

- 6.2.9 Guidance identified as relevant within this assessment is:
- Environmental Impact Assessment: A Guide to Good Practice and Procedures (The Department for Communities and Local Government, 2006) (Ref 6-5) provides advice on the statutory procedures that must be followed for any 'EIA application'. It reflects good practice guidance on the implementation of the process and suggests additional sources of information.
 - Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Management and Assessment (IEMA), 1993) (Ref 6-6) (IEMA Guidelines) sets out guidelines for the assessment of the environmental impact of road traffic associated with developments.
 - Guidance on Transport Assessment (Department for Transport (DfT), 2007) (Ref 6-7) provides guidance on the assessment of a development's potential transport implications.
 - The Design Manual for Roads and Bridges (DMRB) (Highways Agency, 1993) (Ref 6-8) provides a comprehensive manual relating to the design, assessment and operation of trunk roads (including motorways). It may also be applicable in part to other roads with similar characteristics.

6.3. Methodology and Assessment Criteria

Introduction

6.3.2 The approach outlined below has been followed in preparing this Chapter and includes a summary of the legislation, policy and guidance, the consultation undertaken, a description of the study area, the temporal scope, and significance criteria used, together with the limitations and assumptions of the study.

6.3.3 The assessment process adopted the following approach:

- Consultation with statutory consultees and interested parties;
- Obtaining baseline data including desktop studies, undertaking site visits and requesting information from third parties;
- Identification of potential effects of the Development and assessment of the significance; and
- Identification of mitigation measures.

Consultation

6.3.4 Consultation with the City and County of Swansea Council highways officers has been undertaken during the development of the accompanying Transport Assessment and thereby to inform the Environmental Statement Addendum chapter. The Transport Assessment provides the details of the scoping discussions.

Study area

6.3.5 The study area has been determined in accordance with the IEMA Guidelines (Ref 6-6) which suggest a number of rules to delimit the scale and extent of the assessment:

- Include highway links where traffic flows will increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%).
- Include any other specifically sensitive areas where traffic flows will increase by 10% or more.

6.3.6 Sensitive areas are defined by the presence of sensitive receptors, using the criteria recommended in paragraph 2.5 of the IEMA Guidelines and summarised in Table 6-1. Sensitive areas are defined by the presence of sensitive receptors, such as congested junctions, hospitals, community centres, conservation areas, schools or colleges.

Receptor Sensitivity	Receptor Type
Major	Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, accident blackspots, retirement homes, urban/residential roads without footways that are used by pedestrians (IEMA Guidelines Ref 6-6).
Moderate	Traffic flow sensitive receptors including: congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, unsegregated cycleways, community centres, parks, recreation facilities.

Receptor Sensitivity	Receptor Type
Minor	Receptors with some sensitivity to traffic flow: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision.
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions.

Table 6.1 Transport and Access – Receptor Sensitivity

- 6.3.7 The study area has been defined in conjunction with CCSC as the extent of the road network likely to be impacted by the Development and considering where total traffic flows or increases in HGV flows could be greater than 10% (for specifically sensitive areas) or 30% for all other links.
- 6.3.8 The SA1 site is located within CCSC and is currently accessed from two locations on Fabian Way, at Kings Road to the west and opposite Port Tennant Road broadly in the centre of the development. Langdon Road forms the main vehicle route on the northern side of the site and broadly routes east to west. This is currently a no through road at its eastern end, however the aspiration for the SA1 development is that this would eventually form a through route to the Park and Ride junction to the east allowing a further access point into the SA1 site. CCSC also has an aspiration for Kings Road to be for buses only on the exit onto Fabian Way and closed to general traffic and from discussion with CCSC this has been assumed in the Transport Assessment. The study area extent comprises the length of Fabian Way including the three junctions with Kings Road, Port Tennant and McDonalds and the associated links to these junctions.
- 6.3.9 The highway links have been split into sections as follows:
- Section 1a, b and c – Fabian Way
 - Section 2 – Port Tennant Road
 - Section 3a –Langdon Road (Port Tennant Road Junction)
 - Section 3b – Langdon Road (at Park and Ride Junction)

Temporal scope

- 6.3.10 This assessment considers the construction and operational phases of the Development.

Sources of baseline data

- 6.3.11 Baseline data has been obtained via consultation and baseline data collection as set out below. Site survey work has been undertaken to identify sensitivity of receptors situated along the proposed access routes.

Traffic Data

- 6.3.12 Traffic data has been obtained for each of the highway sections considered along the proposed access routes. Background traffic flows have been obtained from CCSC for the Fabian Way / Port Tennant Road junction and the Fabian Way / McDonalds / Park and Ride (P&R) junction for the peak hours on the network. A further automatic traffic count (ATC) survey has been obtained from CCSC on Fabian Way to the west of Kings Road to estimate AADT flows across on all links through factoring from the peak hours. The surveys have been factored to 2015 base year.

- 6.3.13 The approach for establishing background flows at the two key SA1 access junctions is as follows.
- 6.3.14 For the Port Tennant Road / Fabian Way / SA1 junction a traffic movement survey been obtained at this junction from Thursday July 2nd 2009. At the McDonalds junction a full turning count survey has been obtained which was undertaken on Thursday June 26th 2014. Detailed summary of the background traffic flows is presented in the Transport Assessment. All vehicular flows have been converted to Passenger Car Units (PCU's) based on the following PCU factors.
- 6.3.15 When verifying the flows along Fabian Way, the 2009 Port Tennant Road survey was closely matched to the 2014 McDonalds junction survey and as such was considered robust to establish a 2014 background flow position. CCSC has also stated that there have been minimal changes in traffic flows between 2009 and 2014 and accepted that an assessment based on 2009 surveys would be reflective of 2014 conditions.
- 6.3.16 Background flows have been calculated by removing all SA1 traffic in order that the 2010 consented masterplan SA1 traffic and the 2015 proposals can be added and a comparison made of the impacts of the proposed variation in the Masterplan.
- 6.3.17 The 2014 background flows have been factored to 2015 as the base year using agreed growth rates. The growth rates have been derived from the Trip End Model Presentation Program (TEMPO). TEMPO presents the output of the National Trip End Model (NTEM), which forms part of the National Transport Model (NTM). The most recent NTM dataset (6.2) has been used to obtain growth rates. The growth factor has been used from the urban-principal road type and taken from the Swansea (main) area (Level – 00NX1). The growth rates have been summarised as follows:
- 2014-2015 AM Peak: 1.024
 - 2014-2015 PM Peak: 1.030

Accident Data

- 6.3.18 Personal Injury Accident (PIA) data has been obtained for the most recent five year period from 1st January 2009 to 31st December 2013 from CCSC as available on request in February 2015. This data has been used to assess the level of injury accidents occurring on each designated highway section to determine whether there are any accident blackspots along the route.

Significance criteria

- 6.3.19 The assessment of likely significant effects, identification of outline mitigation measures, and assessment of likely residual effects followed the approach outlined below:
- Consideration of best practice/guidance;
 - Professional judgement;
 - Consideration of the baseline information obtained, the Development details and issues raised through consultation with the highway authority;
 - Prediction of potential effects considering baseline information and Development details;
 - Identification of effects which, in particular, could be considered to be potentially significant in terms of the EIA Regulations;
 - Identification of appropriate mitigation; and
 - Prediction of residual effects.

- 6.3.20 Table 2.1 of the Guidelines for the IEMA Guidelines (Ref 6-6) sets out a list of likely significant effects which should be assessed. The guidelines acknowledge that not all of the effects listed would be applicable to every development.

Noise and Vibration

- 6.3.21 The effects of noise and vibration have been assessed within Chapter 8: Noise, which includes an assessment of the impacts of road traffic, and are therefore not included within this Chapter.

Visual Effects

- 6.3.22 The visual effect of traffic is complex and subjective and includes both visual obstruction and visual intrusion. The IEMA Guidelines acknowledge that in the majority of situations, the changes in traffic resulting from a development would have little effect. For the Development there would be negligible visual effects from traffic and as such no detailed assessments have been undertaken within this Chapter.

Severance

- 6.3.23 Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. Severance is difficult to measure, and by its subjective nature, is likely to vary between different groups within a single community. In addition to the volume, composition and speed of traffic, severance is also likely to be influenced by the geometric characteristics of a road, the demand for movement across a road, and the variety of land uses and extent of community located on either side of a road. All these factors are considered when determining the likely severance effect.
- 6.3.24 In general terms, according to the IEMA Guidelines, a 30% change in traffic flow is likely to produce a 'slight' change in severance, with 'moderate' and 'substantial' changes occurring at 60% and 90% respectively.

Driver Delay

- 6.3.25 Delay to drivers generally occurs at links and junctions where the traffic flow increases significantly. The Development may have an impact on the access links and junctions around the site, and these changes will be assessed on links where traffic flows exceed threshold levels (as set out within Rule 1 and Rule 2 of the IEMA Guidelines).

Pedestrian Delay

- 6.3.26 The delay incurred by pedestrians is generally a direct consequence of their ability to cross roads. Thus the provision of crossing facilities, the geometric characteristics of the road, and the traffic volume, composition and speed are all factors that can affect pedestrian delay and have been considered when assessing this effect. The IEMA Guidelines advise that in assessing levels of, and changes in, pedestrian delay, assessors do not attempt to use quantitative thresholds given the range of local factors and conditions which can influence pedestrian delay. Instead, the Guidelines recommend the use of professional judgement to determine whether pedestrian delay is a significant effect.
- 6.3.27 Studies have shown that pedestrian delay is perceptible or considered significant beyond a lower delay threshold of 10 seconds for a link with no crossing facilities. A 10 second pedestrian delay in crossing a road broadly equates to a two-way link flow of approximately 1,400 vehicles per hour.

Pedestrian Amenity

- 6.3.28 The term pedestrian amenity is broadly defined as the relative pleasantness of a journey. It is considered to be affected by traffic flow, speed and composition, as well as footway width, lighting and quality and the separation/protection from traffic. It encompasses the overall relationship between pedestrians and traffic, including fear and intimidation which is the most emotive and difficult effect to quantify and assess. The IEMA Guidelines references a study which suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its HGV component) is halved or doubled.
- 6.3.29 There are no commonly agreed thresholds for estimating levels of danger or fear and intimidation, however the IEMA Guidelines also suggest the adoption of values from Pedestrian Delay, Annoyance and Risk - Imperial College Crompton (1981) (Ref 6-9) when considering any effect on pedestrian fear and intimidation. These thresholds are replicated in Table 6-2 and can be used as a first approximation of the likelihood of pedestrian fear and intimidation, although other factors need to be considered such as proximity to traffic and footpath widths.
- 6.3.30 Table 6.2 Transport and Access – Pedestrian fear and intimidation thresholds

Degree of hazard	Average traffic flow over 18 hour day (vehicles per hour)	Total 18 hour heavy goods vehicle flow	Average speed over 18 hour day (miles per hour)
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

Source: Pedestrian Delay, Annoyance and Risk - Imperial College Crompton (1981) (Ref 6.9)

Accidents and Safety

- 6.3.31 Consideration has been given to the local circumstances, in particular traffic speed, flow and composition, as well as vehicle conflict and pedestrian activity and the potential increases resulting from the Development. These factors enable a professional judgement to be made regarding the significance of the effect.

Hazardous Loads

- 6.3.32 The effects on hazardous loads are not included within this Chapter.

Air Pollution including Dust and Dirt

- 6.3.33 The effects on air quality, dust and dirt are not included within this Chapter. Air quality related to road traffic is dealt with in Chapter 7.

Significance of Effects

- 6.3.34 A set of generic significance criteria are proposed in the Environmental Impact Assessment: A Guide to Good Practice and Procedures (The Department for Communities and Local Government, 2006) (Ref 6-6) to describe the significance of effect. These criteria are outlined in Table 6.3.

6.3.35 Table 6.3 Transport and Access – Criteria for Determining Significance of Effects

Significance of Effect	Description
Major	These effects are likely to be important considerations at a regional or district scale.
Moderate	These effects, if adverse, are likely to be important at the local scale. However, the cumulative effect of these may lead to an overall increase in the impact/effect of traffic.
Minor	Generally related to local issues but the effects are relevant in the detailed design of the Development.
Negligible	Effects are generally beneath levels of perception.

6.3.36 Environmental Impact Assessment: A Guide to Good Practice and Procedures (The Department for Communities and Local Government, 2006) states that significance is a function of the value of resources (international, national, regional or local level importance), the magnitude of the impact, the duration involved, the reversibility of the effect and the number and sensitivity of receptors.

- The significance of effect on each section of the highway network within the study area has been determined taking into account:
- Magnitude of the impact based on the forecast traffic generations associated with the Development, in terms of percentage increases in total traffic and increases in HGV flows;
- Duration of increased traffic volumes associated with the Development – for example, whether the impact occurs during a single short period or throughout the construction programme;
- Reversibility of the effect of traffic associated with the Development;
- Highway characteristics including road classification, existing traffic flows and road geometries of the highway sections; and
- Sensitive receptors identified using the criteria recommended in paragraph 2.5 of the IEMA Guidelines and summarised in Table 6.1.

6.3.37 The magnitude of impact and the sensitivity of the receptor will be compared to determine the significance of effect in conjunction with Table 6.4.

Table 6.4 Transport and Access – Determining the Significance of Effect

Magnitude	Major	Major	Major	Moderate	Minor
	Moderate	Major	Moderate	Minor	Negligible
	Minor	Moderate	Minor	Negligible	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible
		Major	Moderate	Minor	Negligible
		Sensitivity			

- 6.3.38 The determination of the overall significance of the effect is a judgement as to whether the magnitude and duration of impacts, when combined with the characteristics of the highway network and the sensitivity of receptors, would impact at a regional or district scale or are important at the local scale but cumulatively lead to an overall increase in the effects of traffic (as set out in Table 6-4, a Major or Moderate significance of effect). If this is the case, then the effects are considered to be Significant with regard to the EIA Regulations. If the overall effect is likely to be a local issue or beneath levels of perception, it is considered to be Not Significant with regard to the EIA Regulations. Cumulative Effects
- 6.3.39 The cumulative effects of other developments are included within the background traffic growth forecasts.
- 6.3.40 TEMPRO has a policy based approach where the expected growth in housing and economic activity reflects the predictions expected through the planning system. The growth rates therefore include allowances for background traffic growth as well as committed developments. The application of both growth rates and committed development traffic flows could result in double-counting of traffic flows. Therefore any committed development traffic has been assumed to be included through the application of the growth rates, and a separate assessment of committed development flows has not been undertaken. The assessment methodology has been discussed and agreed with CCSC and therefore this approach is considered appropriate.
- 6.3.41 Traffic flows from the Tidal Lagoon development have not been included, as following discussions with CCSC it was agreed that the majority of the traffic would be generated outside the peak periods and therefore the additional flows through the two key junctions on Fabian Way would be minimal. It is therefore considered that the application of growth rates would include the traffic generated by the Tidal Lagoon project.
- 6.3.42 In summary the cumulative effects of other developments in the area are included within the traffic growth forecasts and do not need to be separately assessed.

6.4. Baseline Conditions

Existing Highway Network

- 6.4.2 A description of the existing roads and access arrangements for the Development is detailed below.
- Section 1 (a, b and c) – Fabian Way (A483)**
- 6.4.3 The A483 Fabian Way is a primary distributor route which links Swansea to the M4 at Junction 42 and provides the access from the east into Swansea city centre. It is a dual-carriageway varying from two to three lanes (where there are turning lanes) in each direction along its length.
- 6.4.4 An additional dedicated bus lane is provided from the east of the junction with Langdon Road on the northern perimeter of the SA1 site to the Kings Road junction. The majority of the junctions along its length are signal controlled. The eastern section of the A483 is subject to the national speed limit. To the west of Ashleigh Terrace it reduces to 50mph, with the speed limit restricted to 30mph adjacent to the SA1 development.
- 6.4.5 Footways are provided on both sides of the carriageway with widths generally of at least two metres. Within the vicinity of the SA1 site the southern footway is a shared pedestrian / cycle route. The receptor sensitivity of this section is considered to be of minor receptor sensitivity.

Section 2 – Port Tennant Road

- 6.4.6 Port Tennant Road is a local residential road which provides access to St Thomas and Port Tennant from Fabian Way at the Langdon Road SA1 junction. It is a single carriageway road with an approximate width of 8 metres and runs broadly east to west.
- 6.4.7 To the east of the Kinley Street there are on-street parking bays provided on its northern side which reduces the carriageway width for through vehicle movements to around 5 metres. Port Tennant Road is subject to 30mph speed restrictions and has footways on both sides of the carriageway. It adjoins Fabian Way at its western end and becomes Ysgol Street at its eastern end. There are residential properties and a range of other uses including shops and food premises aligning the carriageway. Overall the receptor sensitivity of the route is considered to be moderate.

Section 3a – Langdon Road (Port Tennant Road Junction)

- 6.4.8 Langdon Road routes broadly east to west expanding across the entire length of the northern section of the SA1 development site; connecting King's Road in the west and Fabian Way in the east at the Park and Ride junction. It has access to Fabian Way at a signalised junction with Port Tennant Rd, which includes a designated pedestrian crossing facility.
- 6.4.9 This section comprises a single carriageway road of approximately 7 metres in width which provides the primary access to SA1. A footway of approximately 2m is located along both sides of the carriageway. The western section of Langdon Road (the section within the SA1 site) has a designated speed limit of 20mph. This section of road is considered to be of minor receptor sensitivity.

Section 3b– Langdon Road (Park and ride Junction)

- 6.4.10 This section of Langdon Road has a designated speed limit of 30mph. It provides access to the retail and commercial area to the south of Fabian Way and the east of the SA1 site. Double yellow line parking restrictions are in place along the majority of the carriageway.
- 6.4.11 The route is currently not open to through vehicle movements from the Park and Ride junction to SA1, although this is an aspiration of CCSC and this route will open up to through vehicle movements as further development on SA1 comes forward. As such it is considered that this section of the route is of minor receptor sensitivity.

Accident Data

- 6.4.12 The obtained accident data for the five year period from 1st January 2009 to 31st December 2013 has been summarised by section, within Table 6.5. In the five year period there were a total of 30 PIAs in the study area, five of which were fatal, five which resulted in serious injury and 20 which resulted in slight injuries.
- 6.4.13 A plot of all observed accidents is included within the Appendix of the Transport Assessment.

	Section 1- Fabian Way	Section 2- Port Tennant Road	Section 3a- Langdon Road (Port Tennant Road Junction)	Section 3b- Langdon Road (Park and Ride Junction)	Total
Accidents by Severity					
Fatal	3	2	0	0	5
Serious	3	1	0	1	5
Slight	13	2	4	1	20
Total	19	5	4	2	30
Accidents by vulnerable road user or large vehicle type					
Pedestrian	5	5	1	0	11
HGV	0	0	0	0	0
Motor-cycle	3	0	0	0	3
Cyclist	0	0	0	0	0
Other	1	0	0	0	1
Total	9	5	1	0	15

Table 6.5 Transport and Access – All Accidents by Severity and Involvement

Section 1 (a, c and c) – Fabian Way

- 6.4.14 There were a total of 19 accidents on this section over the five year period, three fatal, three serious and 13 slight in severity. Each of the fatal accidents involved pedestrians crossing the carriageway. Two of these occurred in the vicinity of the Kings Road junction and one occurred to the east of the Park and Ride junction. Of the three serious accidents, one involved a pedestrian and the remaining two were collisions between at least two vehicles. All three accidents were located within the vicinity of the Port Tennant Road junction.

Section 2 – Port Tennant Road

- 6.4.15 There were a total of five accidents on this section over the five year period, two fatal, one serious and two slight in severity. The two fatal accidents involved pedestrians; one occurred outside the Co-op Pharmacy, where a driver of a vehicle did not see pedestrian on zebra crossing and collided with him. The other occurred within the vicinity of Reginald Road and was the result of a pedestrian falling from the roof of a moving vehicle sustaining fatal injuries. The serious and remaining slight accidents, all involved a collision between a vehicle and a pedestrian.

Section 3a – Langdon Road (Port Tennant Road Junction)

- 6.4.16 There were a total of four accidents on this section over the five year period, all of which were slight in severity. One of the accidents involved a vulnerable road user, a pedestrian stepped into the carriageway into the path of a vehicle.

Section 3b – Langdon Road (Park and ride Junction)

- 6.4.17 A total of two accidents occurred along this section within study period, one serious and one slight in severity. The serious accident occurred within the vicinity of the Park and ride Junction, involving a collision between two vehicles.

Summary

- 6.4.18 The obtained PIA data for the five year study period has been used as a basis to assess the sensitivity of routes with respect to road safety. The data does not indicate a safety deficiency with the highway characteristics.

Baseline Traffic Data

- 6.4.19 The Base Year 2015 flows are shown in Table 6-6. It should be noted that these are the flows on the main road network without any SA1 development. This enables a comparison between the net impacts of the 2015 Masterplan with the 2010 consent.

Highway Links	AADT (all Vehicles)	AADT (HGVs)	% HGVs
Section 1a- Fabian Way (east of Park and Ride junction)	33980	1402	4.1
Section 1b- Fabian Way (between Port Tennant Road and McDonalds junction)	33987	1290	3.8
Section 1c- Fabian Way (west of Port Tennant Road)	35576	1321	3.7
Section 2- Port Tenant Road	3969	131	3.3
Section 3a- Langdon Road (Port Tennant Road Junction)	0	0	0
Section 3b- Langdon Road (Park and Ride Junction)	6038	193	3.2

Table 6-6 Transport and Access – Base Year 2015 Two-way Traffic Flows (SA1 Removed)

Future Conditions with and without Development

- 6.4.20 This section sets out the scenarios for traffic forecasts and the resulting changes in network flows. The assessment of the impact of the Development is then made of the 2015 Masterplan relative to the 2010 consent. Traffic Flow Forecasts
- 6.4.21 The scenarios for which traffic flows have been forecast are as follows:
- 2015 background traffic with the 2010 consented traffic generation – the Do Minimum Scenario 2015
 - 2015 background traffic with the 2015 Masterplan traffic generation – the With Development Scenario 2015

- 2025 background traffic with the 2010 consented traffic generation – the Do Minimum Scenario 2025
- 2025 background traffic with the 2015 Masterplan traffic generation – the With Development Scenario 2025

6.4.22 The net impact of traffic is the difference between the traffic forecasts in the Do Minimum and the With Development scenarios. These traffic flows have been used to assess the impact of the proposals over the consented scheme. The 2015 forecasts only have been used for the purposes of the assessment of environmental impact, given that the base situation is lower and therefore the impacts are proportionately higher.

6.4.23 Table 6.7 shows the AADT flows for each scenario and Table 6.8 shows the changes in the AM and PM peak hours, which are more sensitive to traffic impact given the congestion in the local area.

Highway Links	2015 Do Minimum		2015 With Development	
	Total Traffic	HGV	Total Traffic	HGV
Section 1a- Fabian Way (east of Park and Ride junction)	52052	1619	52001	1618
Section 1b- Fabian Way (between Port Tennant Road and McDonalds junction)	44292	1414	44263	1413
Section 1c- Fabian Way (west of Port Tennant Road)	40831	1384	40816	1384
Section 2- Port Tennant Road	4915	142	4912	142
Section 3a- Langdon Road (Port Tennant Road Junction)	14564	291	14522	290
Section 3b- Langdon Road (Park and Ride Junction)	15747	309	15720	309

Table 6.7 Transport and Access – 2015 Two-way AADT Traffic Flows Comparison of Do Minimum and With Development

Highway Links	AM Peak Hour (0800-0900)		PM Peak Hour (1700-1800)	
	2015 Do Minimum	2015 With Development	2015 Do Minimum	2015 With Development
Section 1a- Fabian Way (east of Park and Ride junction)	4706	4905	4478	4567
Section 1b- Fabian Way (between Port Tennant Road and McDonalds junction)	3844	3956	3738	3788

Section 1c- Fabian Way (west of Port Tennant Road)	3403	3458	3354	3380
Section 2- Port Tennant Road	414	426	454	460
Section 3a- Langdon Road (Port Tennant Road Junction)	1571	1730	1436	1508
Section 3b- Langdon Road (Park and Ride Junction)	1597	1704	1375	1424

Table 6.8: Transport and Access – 2015 Two-way AM and PM Peak Hour Traffic Flows Comparison of Do Minimum and With Development

6.5. Assessment of Effects

Impacts of Operational Phase Vehicle Traffic

- 6.5.2 Table 6.9 presents the percentage change in two way AADT traffic flows on the highway network links of the With Development scenario compared to the Do Minimum.

○ Highway Links	Receptor Sensitivity	Percentage Change	
		Total Traffic	HGV
Section 1a- Fabian Way (east of Park and Ride junction)	Minor	-0.10	-0.06
Section 1b- Fabian Way (between Port Tennant Road and McDonalds junction)	Minor	-0.07	-0.07
Section 1c- Fabian Way (west of Port Tennant Road)	Minor	-0.04	0
Section 2- Port Tennant Road	Moderate	-0.06	0
Section 3a- Langdon Road (Port Tennant Road Junction)	Minor	-0.29	-0.34
Section 3b- Langdon Road (Park and Ride Junction)	Minor	-0.17	0

Table 6.9 Transport and Access – 2015 Two-way AADT Traffic Flows Percentage Change of Do Minimum compared to With Development

- 6.5.3 Table 6-10 presents the percentage change in two way traffic flows in the AM and PM peak hours on the highway network links of the With Development scenario compared to the Do Minimum. It can be seen that the largest percentage impact is in the AM peak hour on Langdon Road at the Port Tennant junction and at the Park and Ride junction and on Fabian Way east of the Park and Ride.

○ Highway Links	Receptor Sensitivity	Percentage Change	
		AM Peak (0800-0900)	PM Peak (1600-1700)
Section 1a- Fabian Way (east of Park and Ride junction)	Minor	4.23%	1.99%
Section 1b- Fabian Way (between Port Tennant Road and McDonalds junction)	Minor	2.91%	1.34%
Section 1c- Fabian Way (west of Port Tennant Road)	Minor	1.62%	0.78%
Section 2- Port Tennant Road	Moderate	2.90%	1.32%
Section 3a- Langdon Road (Port Tennant Road Junction)	Minor	10.12%	5.01%
Section 3b- Langdon Road (Park and Ride Junction)	Minor	6.70%	3.56%

Table 6-10 Transport and Access – 2015 Two-way AM and PM Peak Hour Traffic Flows Percentage Change of Do Minimum compared to With Development

- 6.5.4 In accordance with the IEMA Guidelines all links with a moderate or above receptor sensitivity are considered to be specifically sensitive areas and as such an increase of 10% or above on total traffic flows or HGVs is considered to be potentially significant and requires detailed assessment of the effects. Receptors with minor or negligible significance are only subject to further assessment if there is a forecast increase in excess of 30% on total traffic flows or HGVs.
- 6.5.5 Table 6.9 shows that over a full 24 hour period, the total traffic generation of the 2015 Masterplan reduces compared to that of the consented 2010 Masterplan. The impact on traffic flow is therefore beneficial.
- 6.5.6 Table 6-10 demonstrates that when considering the impacts in the sensitive peak hours, none of the highway links require further assessment. The percentage change in traffic flows does not exceed the threshold levels of significance. For all links with negligible or minor receptor sensitivity it is considered that there is a negligible magnitude of effect. For all links with moderate to major sensitivity it is considered that there would be a minor adverse magnitude of effect. With regard to the EIA Regulations the effects are considered to be Not Significant.

6.6. Mitigation Measures

- 6.6.2 This section sets out the mitigation measures proposed to minimise the potential effects of the Development. However, the effects have all been assessed as Not Significant, and therefore mitigation measures are not considered necessary to reduce predicted effects to a more acceptable level. However, The Transport Assessment identifies potential measures to mitigate junction capacity impacts and other access impacts of the Development (rather than the environmental impacts). These are summarised below on a precautionary basis and as good practice for the environmental assessment.

Construction Phase

- 6.6.3 The details of the construction of the site are yet to be finalised. It is proposed that all routes to the site are agreed with CCSC prior to construction, although it is anticipated that the same routes would be used as for the masterplan development which has been built out to date (direct to and from Fabian Way via Kings Road and Langdon Road).

As a condition of the planning application a Construction Traffic Management Plan could be submitted providing measures to minimise the impact of the proposals at the development stage with mitigation measures suggested where appropriate. Examples of measures which could be implemented are set out below:

- The proposed development could implement techniques and measures to assist in minimising construction vehicle trips on the local highway network, particularly during peak times;
- A plan could be produced detailing measures to reduce the contract duration and the number of trips made;
- A plan could be produced showing the delivery and servicing routes and times during the construction phase; and
- Measures could be set out to encourage construction staff to travel via sustainable modes.

Operational Phase

- 6.6.4 This section outlines the aims and objectives for the proposed development, set out separately within a Framework Travel Plan and Transport Implementation Strategy (TIS) within the TA.

Framework Travel Plan

- 6.6.5 The Framework Travel Plan sets out a strategy and a package of measures designed to manage all aspects of travel (including staff, students and visitors) and ensure the development is accessible by sustainable modes of transport. The purpose of the Travel Plan is to reduce the dependency on the private car, promote sustainable accessibility and promote healthy lifestyles.
- 6.6.6 The aim of the Travel Plan is for 'UWTSD to be exemplar in ensuring sustainable modes of transport are the mode of choice for staff, students and visitors travelling to the University, minimising the impact of the University on the environment and local community'.
- 6.6.7 The Framework Travel Plan sets out:
- A range of objectives of what the Travel Plan is seeking to achieve;
 - Areas of focus for the Travel Plan and a strategy for developing SMART (specific, measureable, achievable, realistic and time-bound) targets;
 - A strategy for implementation and management of the Travel Plan;
 - Measures proposed to encourage sustainable travel, reduce car dependence and achieve the objectives, alongside an action plan outlining the implementation programme for the proposed measures;
 - Information of when and how the Travel Plan will be monitored and reviewed.

Transport Implementation Strategy

- 6.6.8 The Transport Implementation Strategy (TIS) for the development sets out the objectives for the development and the measures proposed to achieve those objectives. This is contained within Chapter 7 of the Transport Assessment.
- 6.6.9 The project aims for the development include to establish a vibrant community within SA1, attract business and support the regeneration of Swansea City Centre. Thus in terms of transport and travel, the objective is 'to provide travel facilities which facilitate the project aims whilst minimising the impact of travel on the surrounding area'.

The movement and access strategy will address the following:

- Sustainable travel: Walking, Cycling and Public Transport
- Access for the mobility impaired;
- Vehicular Traffic and Parking

Potential Highway/ Junction Improvements

- 6.6.10 This section identifies various potential mitigation/ improvements that might be considered without prejudice to discussions regarding the responsibility for funding and implementing measures. The potential mitigation has been developed with reference to the Fabian Way Corridor Transport Development Study (2013), which identifies a range of measures to improve capacity and support walking, cycling and public transport movements in the corridor as well as identified as part of this assessment and in discussions with CCSC.
- 6.6.11 The Transport Assessment identifies that in the 2010 consented and 2015 proposed scenarios the junctions operate over their maximum capacity. Potential mitigation of impacts includes:
- Port Tennant Road / Fabian Way / Langdon Road junction: relocation of the bus priority lane away from the junction so that buses are given priority further back on the link. This would have the benefit of reducing the number of stages at the traffic signals. A MOVA system could also be introduced:
 - McDonalds / Park and Ride / Fabian Way junction. Various ways of improving the junction have been suggested in the Transport Assessment including:
 - Introduction of MOVA to the traffic signals to optimise traffic flow through the junction;
 - Addition of a left turning lane assisting traffic turning into SA1 westbound on Fabian Way; and
 - Further improvements such as the widening of the link connecting the junction with Langdon Road with Fabian Way to provide an additional northbound lane (two lanes for right turning movements).

- 6.6.12 The feasibility and operational benefits of the measures above will require further investigation in discussion with CCSC.

Potential Walking, Cycling and Public Transport Improvements

- 6.6.13 The development will incorporate a network of attractive walking and cycling routes as part of Masterplan, improving access to the waterfront and thus offering wider benefits. Further improvements to on and off site walking and cycling routes could offer mitigation of the development impacts by encouraging mode share by sustainable travel, improve connections for existing communities into SA1 or form part of the wider walking and cycling network. Potential measures include:

- Improved bus stop facilities on Langdon Road to the east of the Port Tennant junction;
- An at-grade pedestrian / cycle crossing of Fabian Way between SA1 junction and Tawe Bridges to improve access to SA1 for residents of the St Thomas area;

This is likely to require some realignment or modification to Fabian Way to achieve a central refuge. Feasibility work would be required to determine a location but it is likely to be easiest to achieve in the vicinity of Sebastopol Street and Lewis Street where the level differences on either side are minimised and the crossing width is less than at the Port Tennant junction.

- A shared use path (walking and cycling) to complete the link from SA1 to the Tidal Lagoon Access Road.

This is likely to require third party land and the feasibility of achieving the link would require investigation.

6.7. Residual Effects

- 6.7.2 This section outlines the predicted residual effects that would prevail as a result of the Development. Given that the impact assessment concludes that the environmental impact of the traffic associated with the variation in the 2015 Masterplan compared to the 2010 consented Masterplan, the residual effects are also negligible and with regard to the EIA Regulations to be Not Significant.

References

Ref 6-1	Welsh Government (2014) Planning Policy Wales, Edition 7
Ref 6-2	Welsh Government (2007) Technical Advice Note 18: Transport (TAN 18)
Ref 6-3	Joint Transport Plan for South West Wales (2015)
Ref 6-4	City and County of Swansea Unitary Development Plan (2008)
Ref 6-5	Department for Communities and Local Government (2006) Environmental Impact Assessment: A Guide to Good Practice and Procedures
Ref 6-6	Institute of Environmental Management and Assessment (IEMA) (1993) Guidelines for the Environmental Assessment of Road Traffic
Ref 6-7	Department for Transport (2007) Guidance on Transport Assessment
Ref 6-8	Highways Agency (1993) The Design Manual for Roads and Bridges (DMRB)
Ref 6-9	Crompton, D H (1981), Pedestrian Delay, Annoyance and Risk - Imperial College

7. Air Quality

7.1. Introduction

- 7.1.1 This section updates the assessment of air quality impacts associated with the development having regard to changes in baseline pollution levels and potential variations in traffic flows in the area as a result of the proposals when compared to the consented scheme described in the underlying outline planning permission 2008/0996 granted on the 11th October 2010.
- 7.1.2 Reference has been made to the City and County of Swansea Council (CCSC) EIA Screening Response dated 25th February 2015 to define the scope of this addendum and allow the assessment to focus on the potential air quality impacts of most concern.

7.2. Policy and Legislative Context

National Air Quality Legislation

- 7.2.1 The following provides a brief overview of national air quality legislation. It should be noted that the relevant regulations have not changed since the 2010 Addendum Environmental Statement.
- 7.2.2 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS), which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was published by the Department for Environment, Food and Rural Affairs (DEFRA) in July 2007¹. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale.
- 7.2.3 The regulations referred to in the AQS have been supplemented by the Air Quality (Wales) Regulations (2010), which came into force on 11th June 2010 and transpose the European Union (EU) Air Quality Directive (2008/50/EC) into Welsh law. Air Quality Limit Values (AQLVs) were published in these regulations for seven pollutants, in addition to Target Values for a further five pollutants. Critical levels for the protection of vegetation were also included for two species.
- 7.2.4 It is noted that the AQOs are generally in line with the AQLVs, although the requirements for the determination of compliance vary.
- 7.2.5 Table 7.1 shows the AQOs for pollutants considered within this assessment.

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
Nitrogen dioxide (NO ₂)	200	1-hour mean; not to be exceeded more than 18 times a year
	40	Annual mean
Particulate matter with an aerodynamic	50	24-hour mean; not to be exceeded more than 35 times a year

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
diameter of less than $10\mu\text{m}$ (PM_{10})	40	Annual mean

Table 7.1: Air Quality Objectives

- 7.2.6 Table 7.2 shows the critical levels for the protection of vegetation for pollutants considered within this assessment.

Pollutant	Critical Level	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
Total oxides of nitrogen (NO_x)	30	Annual mean

Table 7.2 Critical Levels for the Protection of Vegetation

- 7.2.7 It is a requirement of the Environment Act (1995) that Local Authorities (LAs) review current and future air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). Any areas of relevant exposure where the AQO are not, or unlikely to be, achieved should be identified. Where it is anticipated that an AQO will not be met, it is a requirement that an Air Quality Management Area (AQMA) be declared. Where an AQMA is declared, the LA is obliged to produce an Action Plan in pursuit of the achievement of the AQOs.

Planning Policy

- 7.2.8 Planning Policy Wales (PPW)² sets out the Welsh Assembly Government's core policies and principles with respect to land use planning, including air quality. Chapter 13 - Minimising and Managing Environmental Risks and Pollution states that:
- 7.2.9 *"The potential for pollution affecting the use of land will be a material consideration in deciding whether to grant planning permission. Material considerations in determining applications for potentially polluting development are likely to include:*
- Location, taking into account such considerations as the reasons for selecting the chosen site itself;*
 - Impact on health and amenity;*
 - The risk and impact of potential pollution from the development insofar as this might have an effect on the use of other land and the surrounding environment (the environmental regulatory regime may well have an interest in these issues, particularly if the development would impact on an Air Quality Management Area or a Special Area of Conservation);*
 - Prevention of nuisance;*
 - Impact on the road and other transport networks; and*
 - The need, where relevant, and feasibility of restoring the land (and water resources) to standards sufficient for an appropriate after use. (Powers under the Pollution Prevention and Control Act 1999 require an operator to return a site to a satisfactory state on surrender of an Integrated Pollution Prevention and Control Permit)."*

² Planning Policy Wales, Welsh Government, 2014

- 7.2.10 The City and County of Swansea Unitary Development Plan³, adopted in 2008, sets out a range of policies and proposals relating to future development. In relation to air quality, policy EV40 states that:
- 7.2.11 *“Development proposals will not be permitted that would cause or result in significant harm to health, local amenity, natural heritage, the historic environment or landscape character because of significant levels of air, noise or light pollution.”*
- 7.2.12 The above policies have been considered throughout this chapter, when necessary.

7.3. Methodology and Assessment Criteria

- 7.3.1 The development has the potential to affect existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site. Additionally, sensitive land uses may be proposed in areas of existing poor air quality. These factors were considered within the 2002 WAES and 2010 Addendum Environmental Statement. However, impacts associated with the revised proposals may vary due to changes in baseline atmospheric pollution levels, as well as differences in predicted vehicle trip generation associated with the development.
- Potential impacts have therefore been assessed by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:
 - Base year (to enable model verification);
 - Opening year Do-Minimum (predicted traffic flows in 2025 should the proposals not proceed);
 - Opening year Do-Something 1 (predicted traffic flows in 2025 should the proposals detailed in the 2010 AES be completed); and,
 - Opening year Do-Something 2 (predicted traffic flows in 2025 should the current proposals be completed).
- 7.3.2 Reference should be made to Appendix 7.1 for assessment input data and details of the model verification process.
- 7.3.3 Impacts were predicted at the receptors detailed in the 2010 AES as far as practicable. Additional locations were included to account for updated baseline conditions. These are summarised in Table 7.3.

Receptor		National Grid Reference (NGR) (m)	
		X	Y
R1	Port Tennant Road - residential	266662.0	193181.2
R2	Langdon Road - residential	266856.2	193026.7
R3	Fabian Way - residential	266936.6	193167.6
R4	Park & Ride - residential	267952.0	193121.2
R5	Plot E3C (10m from Fabian Way) - residential	267513.7	193003.0
R6	Plot E3C (20m from Fabian Way) - residential	267512.3	192993.9

Table 7.3 Receptors

³ City and County of Swansea Unitary Development Plan, City and County of Swansea, 2008

- 7.3.4 The significance of predicted air quality impacts was determined in accordance with the guidance provided within the Institute of Air Quality Management (IAQM) document 'Land-Use Planning & Development Control: Planning for Air Quality'⁴.
- 7.3.5 Using this methodology, impacts were defined based on the interaction between the predicted pollutant concentration from the Do-Something 2 scenario and the magnitude of change between the Do-Something 1 and Do-Something 2 scenarios, as outlined in Table 7-4.
- 7.3.6 It should be noted that the guidance was released in 2015 and therefore supersedes the significance criteria utilised in the 2010 AES.

Concentration at Receptor in Assessment Year	Predicted Concentration Change as Proportion of AQO (%)			
	1	2 - 5	6 - 10	> 10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

Table 7.4 Significance of Impacts

- 7.3.7 It should be noted that increases in pollutant concentrations would be considered adverse impacts, whilst decreases would be beneficial.
- 7.3.8 The criteria shown in Table 7.4 was also used to determine the significance of impacts at the relevant ecological receptor. The relevant critical load or critical level was utilised in place of the AQO.
- 7.3.9 The matrix shown in Table 7.4 is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that changes of 0%, i.e. less than 0.5%, are described as negligible.
- 7.3.10 Following the prediction of impacts at discrete receptor locations, the IAQM document provides guidance on determining the overall air quality impact significance of the operation of a development. The guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. It should be noted that this is a binary judgement of either it is significant or it is not significant.
- 7.3.11 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

7.4. Baseline Conditions

- 7.4.1 Baseline air quality conditions have changed since the 2002 WAES and 2010 AES. An updated review of the current situation is provided in the following sub-sections.

⁴ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2015.

Local Air Quality Management

- 7.4.2 As required by the Environment Act (1995), City and County of Swansea Council (CCSC) has undertaken a review and assessment of air quality within their area of jurisdiction. This process has not led to the declaration of any further AQMAs since submission of the 2010 AES. As such, a single AQMA therefore remains for the Hafod district in respect to NO₂ which was designated in 2001. The AQMA lies approximately 3km from the study site and does not extend to cover any part of the application site.

Air Quality Monitoring

- 7.4.3 Monitoring of pollutant concentrations is undertaken by CCSC throughout their area of jurisdiction. Recent NO₂ results from sites in the vicinity of the development are shown in Table 7.5.

Monitoring Site	Monitored NO ₂ Concentration (µg/m ³)		
	2011	2012	2013
38	37.23	35.4	33.56
48	23.98	23.52	23.43
291	41.79	45.22	43.73
323	-	-	32.16

Table 7.5 NO₂ Monitoring Results

- 7.4.4 It should be noted that sites without monitoring results from 2013 have not been considered for the purpose of this assessment.
- 7.4.5 As shown in Table 7.5, the annual mean AQO for NO₂ was achieved at three monitoring sites and exceeded at one during recent years. Diffusion tube 291 is located in close proximity to the A483 and therefore elevated concentrations would be anticipated. It is anticipated that the particularly high concentration, when compared with those measured at location 48, is partly related to the positioning of the diffusion tube on the façade of a residential property. This has been shown to record higher levels than monitors in free field conditions.
- 7.4.6 Monitoring of PM₁₀ concentrations is undertaken at one location in the vicinity of the development. Recent results are summarised in Table 7.6.

Monitoring Site	Monitored PM ₁₀ Concentration (µg/m ³)		
	2011	2012	2013
SA1 Junction Port Tennant	-	-	17.65

Table 7.6 PM₁₀ Monitoring Results

- 7.4.7 As shown in Table 7.6, the annual mean AQO for PM₁₀ of 40µg/m³ was not exceeded at the SA1 Junction analyser during 2013.

Background Pollutant Concentrations

- 7.4.8 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. These were updated in 2014 and therefore supersede the previous data included within the 2010 AES.
- 7.4.9 The proposed development site is located in grid square National Grid Reference (NGR): 266500, 193500. Data for this location was downloaded from the DEFRA website⁵ for the purpose of the assessment and is summarised in Table 7.7.

Pollutant	Predicted Background Concentration (µg/m ³)		
	2013	2015	2025
NO _x	19.80	19.42	14.73
NO ₂	14.88	14.66	11.34
PM ₁₀	13.86	13.52	12.79

Table 7.7 Predicted Background Concentrations

- 7.4.10 As shown in Table 7.7, background concentrations are predicted to reduce in future years. This is due to forecast reductions in pollutant releases associated with improved technologies, such as new vehicle emission standards.

7.5. Relevant Development Amendments

- 7.5.1 The changes now proposed to the 2010 outline planning permission considered within 2010 AES have affected the air quality assessment for the following reasons:
- The revised quantum of development has resulted in variations in the number of vehicles predicted to travel to and from the site on a daily basis. These have the potential to affect pollutant concentrations at sensitive locations due to associated exhaust emissions; and,
 - The revised Masterplan may cause exposure of future occupants to elevated pollutant concentrations.
- 7.5.2 Additionally, the field of air quality has progressed since the 2010 AES and consideration has therefore been provided to the following within this Chapter:
- New monitoring results;
 - Updated DEFRA background maps;
 - Updated IAQM guidance;
 - Updated vehicle emission factors;
 - Updated DEFRA assessment tools; and,
 - Updated dispersion modelling software.
 - Likely Effects

⁵ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011>.

7.6. Likely Effects

7.6.1 The proposed development has the potential to cause the following air quality effects:

- Potential effects associated with fugitive dust emissions during the construction phase; and,
- Potential effects associated with road vehicle exhaust emissions during the operational phase.

7.6.2 It is considered that potential effects associated with fugitive dust emissions have been adequately assessed within the 2002 WAES (and the proposed variations to the development will not affect predicted impacts. As such, these have not been considered in detail within the Chapter.

7.6.3 As discussed previously, there are a number of factors that may affect the assessment of road vehicle exhaust emissions detailed within the 2010 AES. As such, effects have been considered within the Chapter.

7.7. Evaluation and Assessment of Effects

7.7.1 Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

Human Receptors

7.7.2 Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the Do-Minimum, Do-Something 1 and Do-Something 2 scenarios. These are summarised in Table 7.8. Reference should be made to Figures 7.1 to 7.6 for a graphical representation of the modelled concentrations. Figure 7.7 presents the receptor locations.

Receptor		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		Do-Minimum	Do-Something 1	Do-Something 2
R1	Port Tennant Road - residential	42.49	45.60	45.59
R2	Langdon Road - residential	18.18	23.10	23.08
R3	Fabian Way - residential	29.83	33.26	33.25
R4	Park & Ride - residential	32.44	38.16	38.14
R5	Plot E3C (10m from Fabian Way) - residential	30.68	34.88	34.86
R6	Plot E3C (20m from Fabian Way) - residential	27.45	31.39	31.38

Table 7.8 Predicted Annual Mean NO₂ Concentrations

7.7.3 As shown in Table 7.8, annual mean NO₂ concentrations were predicted to be below the relevant AQO of 40µg/m³ at five receptors and above at one location. It should be noted that concentrations in the Do-Something 2 scenario are lower than those associated with Do-Something 1. Additionally, there are no new exceedences predicted in the Do-Something scenarios when compared with the Do-Minimum.

- 7.7.4 Predicted concentrations at receptors R5 and R6 are below the relevant AQO. As such, Plot E3C is considered suitable for residential use, subject to a 10m buffer between the building façade and the roadside. If the finalised structure is positioned closer to the highway then additional assessment may be necessary to determine any requirement for mechanical ventilation to ensure future occupants are not exposed to AQO exceedences.
- 7.7.5 Predicted impacts on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 7.9. These represent effects associated with the revised scheme when compared with the 2010 consented development.

Receptor		Predicted Concentration ^(a)	Predicted Concentration Change as Proportion of AQO (%) ^(b)	Impact Significance
R1	Port Tennant Road - residential	110% or more of AQO	0	Negligible
R2	Langdon Road - residential	Below 75% of AQO	0	Negligible
R3	Fabian Way - residential	76 - 94% of AQO	0	Negligible
R4	Park & Ride - residential	95 - 102% of AQO	0	Negligible
R5	Plot E3C (10m from Fabian Way) - residential	76 - 94% of AQO	0	Negligible
R6	Plot E3C (20m from Fabian Way) - residential	76 - 94% of AQO	0	Negligible

Table 7.9 Predicted Annual Mean NO₂ Impacts

- 7.7.6 NOTE: (a) Predicted concentration in Do-Something 2 scenario. (b) Predicted change in concentration between Do-Something 1 and Do-Something 2 scenarios.
- 7.7.7 As shown in Table 7.9, predicted impacts on annual mean NO₂ concentrations as a result of the revised proposals are negligible at all receptor locations when compared with the consented development.
- 7.7.8 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the Do-Minimum, Do-Something 1 and Do-Something 2 scenarios. These are summarised in Table 7.10.

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		Do-Minimum	Do-Something 1	Do-Something 2
R1	Port Tennant Road - residential	15.69	15.99	15.99
R2	Langdon Road - residential	14.09	14.47	14.47
R3	Fabian Way - residential	15.09	15.44	15.44
R4	Park & Ride - residential	15.32	15.96	15.95

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		Do-Minimum	Do-Something 1	Do-Something 2
R5	Plot E3C (10m from Fabian Way) - residential	15.18	15.61	15.61
R6	Plot E3C (20m from Fabian Way) - residential	14.88	15.25	15.25

Table 7.10 Predicted Annual Mean PM₁₀ Concentrations

- 7.7.9 As shown in Table 7.10, annual mean PM₁₀ concentrations were predicted to be below the relevant AQO of 40µg/m³ at all receptor locations.
- 7.7.10 Predicted impacts on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 7.11. These represent effects associated with the revised scheme when compared with the 2010 consented development.

Receptor		Predicted Concentration (a)	Predicted Concentration Change as Proportion of AQO (%) ^(b)	Impact Significance
R1	Port Tennant Road - residential	Below 75% of AQO	0	Negligible
R2	Langdon Road - residential	Below 75% of AQO	0	Negligible
R3	Fabian Way - residential	Below 75% of AQO	0	Negligible
R4	Park & Ride - residential	Below 75% of AQO	0	Negligible
R5	Plot E3C (10m from Fabian Way) - residential	Below 75% of AQO	0	Negligible
R6	Plot E3C (20m from Fabian Way) - residential	Below 75% of AQO	0	Negligible

Table 7.11 Predicted Annual Mean PM₁₀ Impacts

- 7.7.11 NOTE: (a) Predicted concentration in Do-Something 2 scenario.
- 7.7.12 (b) Predicted change in concentration between Do-Something 1 and Do-Something 2 scenarios.
- 7.7.13 As shown in Table 7.11, predicted impacts on annual mean PM₁₀ concentrations as a result of the revised proposals are negligible at all receptor locations when compared with the consented development.

Ecological Receptors

- 7.7.14 Crymlyn Bog is designated a Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI) and Ramsar. It is located approximately 690m from the application site boundary and 50m from Fabian Way and has been assessed in terms of traffic related pollution using dispersion modelling as described above.
- 7.7.15 Habitats may be affected through changes in:
- Ambient atmospheric pollutant concentrations; and,
 - Deposition of certain compounds
- 7.7.16 The potential effects on habitats within protected sites are quantified by comparing the predicted concentrations to empirically derived thresholds above which damage to vegetation is known to occur. There are two standards used to assess the potential effect of emissions on sensitive ecological receptors. These are:
- Critical levels; and
 - Critical loads
- 7.7.17 Critical loads and critical levels are quantitative estimates of exposure to one or more pollutants, below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge. The critical load relates to the quantity of pollutant deposited from air to the ground, whereas the critical level is the gaseous concentration of a pollutant in the air.
- 7.7.18 The critical loads for nitrogen deposition depends on the habitat type potentially affected. The Air Pollution Information Service (APIS) website⁶ includes a number of broad habitat types for use in the searchable database of critical loads. The relevant habitat was classified as valley mires, poor fens and transition mires for Crymlyn Bog.
- 7.7.19 APIS was consulted to obtain the relevant critical loads and baseline pollution levels for the designation. These are summarised in Table 7.12.

Receptor		Critical Loads for Nitrogen Deposition (kgN/ha/yr)		Baseline Nitrogen Deposition (kgN/ha/yr)	Baseline NO _x Concentration (µg/m ³)
		Low	High		
E1	Crymlyn Bog	5	10	11.48	13.31

Table 7.12 Ecological Designation Features

- 7.7.20 As shown in Table 7.12, both critical loads are exceeded at Crymlyn Bog as a baseline condition. However, annual mean NO_x concentrations are below the relevant critical level.
- 7.7.21 Nitrogen deposition as a result of road vehicle exhaust emissions was predicted using dispersion modelling at NGR: 268207, 193203, which is the closest point of Crymlyn Bog to Fabian Way. The results were then added to the existing baseline levels for each scenario. These are shown in Table 7.13.

⁶ www.apis.ac.uk.

Receptor		Predicted Annual Nitrogen Deposition (kgN/ha/yr)		
		Do-Minimum	Do-Something 1	Do-Something 2
E1	Crymlyn Bog	12.33	12.64	12.64

Table 7.13 Predicted Annual Nitrogen Deposition

- 7.7.22 As shown in Table 7.13, predicted annual nitrogen deposition rates exceed both the low and high critical loads at Crymlyn Bog. This is partly due to the existing baseline exceedence.
- 7.7.23 Predicted impacts on annual nitrogen deposition at Crymlyn Bog are summarised in Table 7.14. These represent effects associated with the revised scheme when compared with the 2010 consented development.

Receptor		Predicted Deposition Rate ^(a)	Predicted Deposition Rate Change as Proportion of Critical Load (%) ^(b)	Impact Significance
E1	Crymlyn Bog	110% or more of critical load	0	Negligible

Table 7.14 Predicted Annual Nitrogen Deposition Impacts

- 7.7.24 NOTE: (a) Predicted deposition rate in Do-Something 2 scenario. (b) Predicted change in deposition rate between Do-Something 1 and Do-Something 2 scenarios.
- 7.7.25 As shown in Table 7.14, predicted impacts on annual nitrogen deposition as a result of the revised proposals are negligible at the Crymlyn Bog designation when compared with the consented development.
- 7.7.26 The annual mean NO_x concentration was predicted at Crymlyn Bog. The results are shown in Table 7.15.

Receptor		Predicted Annual Mean NO _x Concentration (µg/m ³)		
		Do-Minimum	Do-Something 1	Do-Something 2
E1	Crymlyn Bog	24.86	29.25	29.24

Table 7.15 Predicted Annual Mean NO_x Concentrations

- 7.7.27 As shown in Table 7.15, predicted annual mean NO_x concentrations were predicted to be below the relevant critical level of 30µg/m³ at Crymlyn Bog for all assessment scenarios.
- 7.7.28 Predicted impacts on annual mean NO_x concentrations at Crymlyn Bog are summarised in Table 7.16. These represent effects associated with the revised scheme when compared with the 2010 consented development.

Receptor		Predicted Concentration ^(a)	Predicted Concentration Change as Proportion of Critical Level (%) ^(b)	Impact Significance
----------	--	--	---	---------------------

E1	Crymlyn Bog	95 - 102% of AQO	0	Negligible
----	-------------	------------------	---	------------

Table 7-16 Predicted Annual Mean NO_x Impacts

- 7.7.29 NOTE: (a) Predicted concentration in Do-Something 2 scenario. (b) Predicted change in concentration between Do-Something 1 and Do-Something 2 scenarios.
- 7.7.30 As shown in Table 7.16, predicted impacts on annual mean NO_x concentrations as a result of the revised proposals are negligible at the Crymlyn Bog designation when compared with the 2010 consented development.

7.8. Proposed Mitigation

- 7.8.1 There are a number of mitigation options available to reduce or off-set potential air quality impacts. However, all techniques have financial implications and may therefore affect scheme viability. As such, they should only be included if necessary.
- 7.8.2 Although negligible air quality impacts were predicted as a result of the development when compared with the consented scheme, a number of mitigation measures are proposed to in accordance with the requirements of the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'⁷ to encourage the use of sustainable transport modes, manage vehicle flow and reduce pollution around the site. These include the following to minimise increases in pollution levels above baseline as far as practicable:
- Provision of a Travel Plan for the development to encourage sustainable modes of transport to and from the site;
 - Inclusion of cycle parking;
 - Inclusion of staff changing facilities with showers and lockers on office and commercial plots to encourage cycling to and from work;
 - Inclusion of green infrastructure throughout the development to reduce atmospheric pollution through increased levels of deposition and absorption;
 - Consideration of final building configurations to avoid the creation of street canyons as far as practicable;
 - Provision of electric charging points throughout the development. A rate of one rapid charge point per ten residential dwellings and/or 1,000m² of commercial floorspace is suggested within the IAQM guidance; and,
 - All gas-fired boilers to meet a minimum emission standard of less than 40mgNO_x/kWh.
- 7.8.3 The above methods are based upon those outlined in the IAQM document 'Land-Use Planning & Development Control: Planning for Air Quality'⁸. As such, implementation should encourage site access by sustainable transport measures and minimise air quality impacts throughout the operational phase.

7.9. Residual Effects

- 7.9.1 Residual effects associated with operational phase road vehicle exhaust emissions are predicted to be **negligible**. As such, they are considered **not significant**, in accordance with the IAQM guidance.

⁷ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2015.

⁸ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2015.

- 7.9.2 Although not considered within this Chapter, potential effects associated with fugitive dust emissions during the construction phase are also considered to be **negligible** in accordance with the findings of the 2002 WAES and the effectiveness of standard control measures which could be required by condition if deemed necessary by CCSC.

7.10. Conclusion

- 7.10.1 The proposed development has the potential to cause air quality impacts. A number of factors required the assessments provided in the 2002 WAES and 2010 AES to be updated.
- 7.10.2 Potential air quality effects associated with road vehicle exhaust emissions were assessed using dispersion modelling. The results indicated predicted impacts would be **negligible** at all sensitive locations when compared with the 2010 consented development.
- 7.10.3 Although negligible effects were predicted, a number of mitigation options were identified to control emissions from the development and minimise increases in pollution levels as a result of the proposals.
- 7.10.4 Refer to Appendix 7 for Air Quality figures and plans.

8. Noise

8.1. Introduction

- 8.1.1 This chapter has been prepared by Hyder Consulting to assess the current noise environment in the vicinity of the variation of condition application site (the SA1 Waterfront Innovation Quarter) and potential likely significant effects on the proposed mixed use development.
- 8.1.2 Surveys have been carried out to establish ambient and background noise levels. These noise levels have been used to set prospective environmental noise limits for construction works and for post-construction operational noise limits in accordance with planning guidance. Measured ambient noise levels would also be compared with current planning guidance for noise intrusion on residential development.
- 8.1.3 The proposed changes to the SA1 Development site would result in changes to the original traffic volumes associated with the original SA1 use for which planning permission has been obtained. The assessment considers the changes in traffic noise associated with the proposed change in land use for SA1.
- 8.1.4 Outline planning permission was granted for SA1 Swansea Waterfront (formerly Port Tawe
- 8.1.5 Innovation Village) in August 2003 under planning reference 2002/1000. The assessments in the ES were based on the scheme described in the RPS Development Framework. Over time the success of the development and market changes have led to pressures to increase the scale of new buildings and to alter the proposed land use mix. In 2009 the Council concluded that an addendum to the original Environmental Statement would be required in order to properly assess the impact of the proposed changes.
- 8.1.6 The SA1 Swansea Waterfront Addendum Environmental Statement April 2010 updates the Noise and Vibration chapter of the WAES and considers noise impacts from changes to the traffic generation of the development and implications of changes to the land use mix and late evening noise.
- 8.1.7 This assessment compares the noise impacts associated with the proposed development changes to that set out under the baseline outline planning permission in 2010. The conditions set out in the 2010 planning permission are as follows:

Condition 16 (General Compliance)

- 8.1.8 *The mitigation measures in respect of noise and vibration identified in Section B6 of the Environmental Statement and Addendum Environmental Statement shall be incorporated into the development proposals and processes unless otherwise agreed in writing with the Local Planning Authority.*

Condition 17 (In accordance with Phasing Programme)

- 8.1.9 *The urban design guidance to be approved pursuant to conditions 4 and 5 shall address the issue of noise (i.e. unwanted sound), noise avoidance and noise attenuation within the development. Reserved matters applications shall accord with this guidance.*

8.2. National Policy

Planning Policy Wales

8.2.1 Planning Policy Wales was originally published in 2002 and sets out the Welsh Government's core policies and principles on land use planning. It sets the context for planning in Wales, under which Local Planning Authorities prepare their statutory Development Plans. Sections of the document get updated from time to time to reflect changes in policy. Planning Policy Wales Edition 7 is the latest version of PPW, issued in July 2014.

8.2.2 The policy considers the links between the land use planning and pollution control systems and how the interaction should be dealt with, within the planning process. With respect to noise and planning Chapter 13 of Planning Policy Wales:

"The objective of a policy for noise is to minimise emissions and reduce ambient noise levels to an acceptable standard. Noise Action Plans, drawn up by the Welsh Ministers in relation to Wales under the Environmental Noise Directive, and the Wales Regulations, aim to prevent and reduce environmental noise where necessary and preserve environmental noise quality where it is good."

8.2.3 Development plan policies should be designed to ensure, as far as is practicable, that noise-sensitive developments, such as hospitals, schools and housing, that need to be located close to the existing transportation infrastructure to facilitate access, are designed in such a way as to limit noise levels within and around those developments. Such development should be located away from existing sources of significant noise including air transport and some industrial activities or programmed development such as improved or new roads. Policies should also be designed to ensure, as far as possible, that potentially noisy developments are located in areas where noise will not be such an important consideration or where its impact can be minimised. Local planning authorities should adopt policies to prevent potentially noisy developments in areas which have remained relatively undisturbed by noise. Development plan policies should have regard to any relevant Noise Action Plan, including the need to protect urban 'quiet areas' against an increase in noise.

8.2.4 The PPW is supplemented by a series of Technical Advice Notes (TANs), which is procedural guidance given by the Welsh Office / National Assembly for Wales / Welsh Assembly Government circulars.

Technical Advice Note Wales (TAN) 11

8.2.5 Technical Advice Note (Wales) 11 – Noise (TAN 11) (Ref 2) was published in 1997, sets out the Government's policies on noise related planning issues. It gives guidance to local authorities in Wales on the use of their planning powers to minimise the adverse impact of noise by:

- detailing the considerations to be taken into account when determining planning applications for both noise-sensitive developments and for those activities which will generate noise;
- setting out noise exposure categories for residential development, encourages their use and recommends appropriate levels for exposure to different sources of noise; and
- advising on the use of planning conditions to minimise the impact of noise.

8.2.6 The four noise exposure category bands set out in TAN11 are designed to assist local planning authorities in evaluating applications for residential development in noisy areas.

- 8.2.7 For the assessment of internal noise levels, TAN11 recommends the use of BS8233: 1987 since superseded by BS8233: 2014 'Sound insulation and noise reduction for buildings - code of practice' (Ref 3), and this guidance along with the TAN11, is summarised in section 4.

8.3. Local Planning Policy

Unitary Development Plan

- 8.3.1 The City and County of Swansea Unitary Development Plan (UDP) (Ref 4) was adopted on 10th November 2008. It is the most up to date Development Plan covering the authorities' administrative area and is used in the determination of planning applications. The UDP sets out a range of policies and proposals relating to future development, and deals with the use and conservation of land and buildings within the City and County up to 2016.
- 8.3.2 Policy EV40 states that development proposals will not be permitted that would cause or result in significant harm to health, local amenity, natural heritage, the historic environment or landscape character because of significant levels of air, noise or light pollution.
- 8.3.3 Where proposed development is to be located in close proximity to a source of noise pollution, or includes possible noise conflicts within the proposed site, proposals will be required to incorporate design, landscaping and other measures to minimise the effects on future occupants. The layout of buildings can frequently be designed or modified to reduce the effects of noise disturbance. Similarly schemes can be designed to incorporate materials, features and landscaping which reduce the impact of noise on the surrounding buildings. Where there are potential noise implications, developers may be required to provide an assessment of noise impact, together with proposals for mitigation in support of planning applications.

Swansea Local Development Plan

- 8.3.4 The Swansea Local Development Plan Preferred Strategy 2013 (Ref 5) Policy 14: Safeguarding the Environment states:
- 8.3.5 "The County's environment will be protected from materially harmful development and where possible enhanced. Development that would result in unacceptable adverse environmental effects will not be permitted, particularly in respect of air, noise or light pollution. Environmental effects can arise directly from a proposed development or can be an effect on the proposed development from an existing land use. This policy aims to ensure that development that would cause an unacceptable damaging impact is not permitted and that incompatible development and land uses are not located close to the source of an existing environmental problem".

County and City of Swansea Residential Design Guide

- 8.3.6 The County and City of Swansea Residential Design Guide (adopted January 2014) (Ref 6), Core theme 3 provides for healthy urban environment and design by promoting and adopting practices that protect all people from toxic and health-damaging exposure, air pollution and noise.
- 8.3.7 When designing for higher density living standards of public neighbourhood space, local amenity, internal housing space, potential noise disturbance, and general environment and design should all be considered.

8.4. Assessment Methodology

- 8.4.1 The methodology comprises assessing the existing ambient noise environment to establish the baseline conditions.

Baseline Noise Surveys

8.4.2 The main noise level indices used in this assessment are:

- $L_{Aeq, T}$ - the A-Weighted sound pressure level of a steady sound, which contains the same acoustic energy as the noise being assessed over a specific time period, T, and is used in this assessment as the unit of measurement for the average noise level throughout the survey period.
- L_{Amax} - the maximum value that the A-weighted sound pressure level reaches during a measurement period
- The L_{A90} is the noise level exceeded for 90% of the measurement period. It is generally used to quantify the background noise level, the underlying level of noise that is present even during the quietest 10% of the measurement period and can be considered to be the 'average minimum' noise level.

8.4.3 Baseline surveys were carried out based on continuous monitoring over a 24-hour period from 26th March 2015 to monitor noise levels over daytime and night time periods. The parameters logged included L_{Aeq} , L_{Amax} and L_{A90} at 5-minute intervals.

Planning Policy Wales – Technical Advice Note 11

8.4.4 TAN 11 indicates that, when assessing a proposal for residential development near a source of noise, local planning authorities should determine into which of the four noise exposure categories (NECs) the proposed site falls, taking account of both day and night-time noise levels. Local planning authorities should then have regard to the advice in the appropriate NEC, as below (Table 8-1):

A	Noise need not be considered as a determining factor in granting planning permission, although the noise level at the high end of the category should not be regarded as desirable.
B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example, because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

Table 8.1 Noise Exposure Categories

8.4.5 A recommended range of noise levels is given in Table 8.2 for each of the NECs for dwellings exposed to noise from road, rail, air and mixed sources. However, in some cases it may be appropriate for local planning authorities to determine the range of noise levels they wish to attribute to the various NECs. Where there is a clear need for new residential development in an already noisy area some or all NECs might be increased by up to 3 dB(A) above the recommended levels. In other cases, a reduction of up to 3 dB(A) may be justified.

Noise Levels⁽¹⁾ corresponding to the Noise Exposure Categories for New Dwellings $L_{Aeq,T}dB$					
Noise Source		Noise Exposure Category			
		A	B	C	D
road traffic	0700-2300	<55	55-63	63-72	>72

	2300-0700 ⁽²⁾	<45	45-57	57-66	>66
rail traffic	0700-2300	<55	55-66	66-74	>74
	2300-0700 ⁽²⁾	<45	45-59	59-66	>66
air traffic ⁽³⁾	0700-2300	<57	57-66	66-72	>72
	2300-0700 ⁽²⁾	<48	48-57	57-66	>66
mixed sources ⁽⁴⁾	0700-2300	<55	55-63	63-72	>72
	2300-0700 ⁽²⁾	<45	45-57	57-66	>66
Notes					
⁽¹⁾ Noise levels: the noise level(s) ($L_{Aeq,T}$) used when deciding the NEC of a site should be representatives of typical conditions.					
⁽²⁾ Night-time noise levels (2300-0700): sites where individual noise events regularly exceed 82dB L_{Amax} (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8H}$ (except where the $L_{Aeq,8H}$ already puts the site in NEC D).					
⁽³⁾ Aircraft noise: daytime values accord with the contour values adopted by the Department of Transport which relate to levels measured 1.2m above open ground. For the same amount of noise energy, contour values can be up to 2 dB(A) higher than those of other sources because of ground reflection effects.					
⁽⁴⁾ Mixed sources: this refers to any combination of road, rail, air and industrial noise sources. The "mixed source" values are based on the lowest numerical values of the single source limits in the table. The "mixed source" NECs should only be used where no individual noise source is dominant.					
To check if any individual noise source is dominant (for the purposes of this assessment) the noise level from the individual sources should be determined and then combined by decibel addition (remembering first to subtract 2 dB(A) from any aircraft noise contour values). If the level of any one source then lies within 2 dB(A) of the calculated combined value, that source should be taken as the dominant one and the site assessed against the appropriate NEC for that source, rather than using the "mixed source" NECs. If the dominant source is industrial noise see paragraph B17 of Appendix B.					
If the contribution of the individual noise sources to the overall noise level cannot be determined by measurement and/or calculation, then the overall measured level should be used and the site assessed against the NECs for "mixed sources".					

Table 8.2 Recommended Noise Exposure Categories (TAN 11)

- 8.4.6 Formerly a code of practice, the recent 2014 revision of BS82332: 2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' has recently been issued as a guidance document. The standard is mainly concerned with building design from an acoustic standpoint. It does however contain information relevant to environmental noise more specifically by stating guidance for desirable internal noise levels for dwellings and other buildings. An extract of Table 4 of the document is reproduced in Table 8-3 below:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35dB $L_{Aeq,(16hour)}$	-
Dining	Dining room /area	40dB $L_{Aeq,(16hour)}$	-

Sleeping (Daytime resting)	Bedroom	35dB L _{Aeq} (16hour)	30dB L _{Aeq} (8hour)
-------------------------------	---------	--------------------------------	-------------------------------

Table 8.3 Indoor ambient noise levels for dwellings (Table 4: BS8233-2014)

- 8.4.7 The information contained within Table 8-3 (Table 4 of BS8233: 2014) is based upon research by the World Health Organisation (WHO) 'Guidelines for Community Noise'.
- 8.4.8 The World Health Organisation (WHO) 'Guidelines for Community Noise' (Ref 7) recommends environmental daytime noise limits to avoid unnecessary annoyance. The maximum external environmental daytime noise is 55 dB L_{Aeq} over the 16 hour period (0700 – 2300). For the evening a 45 dB L_{Aeq} 8 hour noise level (2300 – 0700) is a recommended maximum outside bedroom windows. This is equivalent to an internal noise level of 30 dB L_{Aeq} with the window partially open.
- 8.4.9 The WHO 'Night noise guidelines for Europe' (Ref 8) states that an L_{night}, outside of 40 dB should be the target to protect the public, including the most vulnerable groups such as children, the chronically ill and the elderly.

8.5. Operational Plant Noise (BS4142)

- 8.5.1 BS 4142:2014 'Methods for rating industrial and commercial sound' (Ref 9) is used to determine the impacts of noise from the commercial component of the development upon residential units. The guidance provided within BS 4142 provides a method whereby the likelihood of complaints due to noise from industrial sources can be assessed.
- 8.5.2 The BS4142 standard advises that the existing background noise levels outside noise sensitive premises are compared with the rating noise levels from any nearby industrial activities. The rating noise level should include corrections for any acoustic character to the noise that makes it more readily discernible to a listener (e.g. whines, crashes, bangs etc.).
- 8.5.3 The background noise level (L_{A90}) is the noise level that is exceeded for 90% of the monitoring period at the assessment location. For BS 4142 it is usual to measure the background noise level at the nearest noise sensitive receptor to the industrial noise source. The specific noise level is the L_{Aeq} produced by the noise source under investigation, measured as close as possible to the source, over a given reference time interval.
- 8.5.4 BS4142 also provides corrections that should be applied to the predicted or measured commercial/industrial noise levels where the commercial/industrial noise contains characteristics that make the noise more intrusive. These characteristics include tonality, impulsivity, and intermittency. The corrections can be significant, meaning that noise containing these characteristics may be severely penalised. The corrections are summarised below.

Commercial/industrial noise characteristic	Perceptibility		
	Just perceptible	Clearly perceptible	Highly perceptible
Tonality	+2	+4	+6
Impulsivity	+3	+6	+9
Intermittency	0	+3	+3

Commercial/industrial noise characteristic	Perceptibility		
	Just perceptible	Clearly perceptible	Highly perceptible
Other sound characteristics	0	+3	+3

Table 8.4 Corrections for Acoustic Features of Commercial or Industrial Noise

- 8.5.5 The greater the difference between rating level and background noise level, the greater the magnitude of impact.
- A difference of around +10 dB or more indicates a significant adverse impact, depending on the context.
 - A difference of around + 5 dB is likely to be an indication of adverse impact, depending on the context .
 - The lower the rating level is relative to the measured background noise level, the less likely it is the specific noise level will have an adverse impact or significant adverse impact.

8.6. Construction Noise

British Standard 5228:2009 +A1: 2014

- 8.6.1 Construction noise impacts were assessed in accordance with BS 5228 2009 +A1:2014 “Code of practice for noise and vibration control on construction and open sites” – Part1: Noise (Ref 10). BS5228: - Part 1 provides recommendations for basic methods of noise and vibration control relating to construction and open sites.
- 8.6.2 BS5228: - Part 1: Noise provides guidance and recommendations on methods for the calculation of construction noise and the consequential assessment of its impact on those exposed to it.
- 8.6.3 In addition the Standard makes reference to the legislative background regarding noise control on construction sites, and gives recommendations for basic methods of noise control. The standard provides suitable methods for the calculation of noise from construction activities, including information regarding noise levels from a range of construction equipment.
- 8.6.4 BS 5228: - Part 1, Annex E gives different methods of guidance on significance of noise effects from construction, and recommends the ABC method to establish construction noise limits.
- 8.6.5 The ABC method involves rounding the existing ambient noise levels to the nearest 5dB for the appropriate time period (night, evening/weekends or day) and then comparing these levels to the total noise level, including construction noise. If the total noise level exceeds the existing rounded value, then a significant effect is deemed to have occurred. This can be seen more clearly in Table 8-5.

Assessment Category and Threshold Value Period	Threshold Value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends	55	60	65

Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
--	----	----	----

Table 8.5 Threshold of significant effect at dwellings from construction

- 8.6.6 Category A is the threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values
- Category B is the threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values
 - Category C is the threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values
- 8.6.7 If the existing ambient noise levels are higher than the threshold values presented in Table 8-5 then a significant effect is deemed to have occurred if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity. The ABC method should only apply to residential receptors.
- 8.6.8 BS 5228 2009 +A1 2014, Part 2: Vibration (Ref 10) provides guidance in relation to the effects of construction vibration upon the surroundings. Vibration, even of a very low magnitude, can be perceptible to people. Vibration nuisance is frequently associated with the assumption that, if vibration can be felt, then damage is inevitable. However, considerably greater levels of vibration are required to cause damage to buildings and structures. Typically levels of 0.3mm/s may just be perceptible, and levels above 10mm/s may result in cosmetic damage to buildings.

8.7. Traffic Noise

- 8.7.1 Traffic noise impacts would be considered in accordance with the guidance provided in the Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 HD213/11 'Noise and Vibration' Detailed Assessment methodology (HD213/11) (Ref 11).
- 8.7.2 In the UK, traffic noise is normally assessed using $LA_{10,18hr}$ index, defined as the arithmetic mean of the dB(A) noise levels exceeded for 10% of the time in each of the 18, one-hour periods between 06:00-00:00 on a typical weekday. This takes account of the diurnal variation in traffic noise. Annual average weekday traffic (AAWT) flows, speeds and percentage of heavy vehicles is used to allow for seasonal variations.
- 8.7.3 HD213/11 provides classification for the magnitude of changes in road traffic noise. A change in road traffic noise of 1dB(A) in the short term (Do-Minimum to Do- Something in the baseline year) is the smallest that is considered perceptible.
- 8.7.4 In the long term (Do-Minimum in the baseline year to Do-Something in the future assessment year) a 3dB(A) change is considered to be perceptible. The magnitudes of impact in the short and long term are therefore considered to be different. For road traffic noise the classification of magnitude of change is reproduced from HD213/11 in Table 8-6 and Table 8-7 for the short and long term respectively.

Noise Change $L_{A10, 18 \text{ Hour}}$	Magnitude of Impact
0	No Change
0.1 - 0.9	Negligible
1 - 2.9	Minor
3 - 4.9	Moderate
5 +	Major

Table 8.6 Classification of magnitude of noise impacts in the short term

Noise Change $L_{A10, 18 \text{ Hour}}$	Magnitude of Impact
0	No Change
0.1 - 2.9	Negligible
3 - 4.9	Minor
5 - 9.9	Moderate
10 +	Major

Table 8.7 Classification of magnitude of noise impacts in the long term

8.8. Results

Baseline Surveys

- 8.8.1 Baseline survey locations were agreed with the Environmental Health Officer (EHO) at Swansea City and County Council (the Council). Baseline surveys were carried out on 26 and 27 March 2015. The baseline survey report is included in Appendix 8.1. The baseline survey data is summarised in Table 8-8.
- 8.8.2 Position 1: A position at the north of the site, approximately 10m back from Kings Road. Measurements were taken at 1.2m above ground level.
- 8.8.3 Position 2: A position at the south of the site, set back from the site boundary. Measurements were taken at 1.5m above ground level.

Location	$L_{Aeq, 0700-2300hrs}$	$L_{Aeq, 2300-0700hrs}$	$L_{A90, 0700-2300hrs}$	$L_{A90, 2300-0700hrs}$
Position 1	51dB	45dB	39dB	41dB
Position 2	49dB	49dB	48dB	48dB

Table 8.8 Baseline survey results

Tan 11 Residential Noise Criteria

- 8.8.4 The baseline survey data in Table 8-9 has been compared against the NEC categories in Table 8-2.

Location	Period	$L_{Aeq, T}$	Noise Exposure Category (NEC)
Position 1	$L_{Aeq, 0700-2300hrs}$	51dB	NEC A
	$L_{Aeq, 2300-0700hrs}$	45dB	NEC B
Position 2	$L_{Aeq, 0700-2300hrs}$	49dB	NEC A
	$L_{Aeq, 2300-0700hrs}$	49dB	NEC B

Table 8.9 Assessment of Baseline Survey Data against NEC categories

- 8.8.5 Based on measured noise levels at Position 1 (away from the river) ambient noise levels across the site would fall under NEC A of TAN 11 for daytime and lower end of the scale for NEC B at night. Night-time noise levels at Position 2 are marginally higher due to the flow of the river, however are not considered excessive.

- 8.8.6 According to the criteria in TAN 11 (as set out in Table 8-1), noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection.
- 8.8.7 BS 8233 provides guide values for the sound insulation of typical windows. A standard partially open window would provide an attenuation of 15 dB. Therefore, with windows open at night, an internal noise level of 34 dB(A) is indicated. This is marginally above the 30dB optimum design internal noise limit for bedrooms at night.
- 8.8.8 During consultation with the EHO for the Council, it was indicated that a planning application had been approved for a proposed glass recycling facility at the industrial units to the south east of the Site. The approval of the planning application for the glass recycling facility (Application No 2014/1982) was approved by letter on 11 March 2015, which sets out the following condition:

Condition 3:

Prior to the commencement of the use, a detailed site operation plan shall be submitted to and approved in writing by the Local Planning Authority. The plan shall include:

- An internal layout plan indicating the siting of all plant and machinery;
- Control of external entrances to ensure that they are closed during tipping operations of waste materials and closed for as long as practically possible during any other significant noise generating activity;
- Noise attenuation/sound proofing measures, including precise timescales for their implementation.
- Details for covering any materials entering and leaving the building by vehicle or conveyor or any other means to load onto ships.
- Details of store facilities for waste paper material arising from the container glass prior to its disposal or recycling;
- Protection measures for the shed walls from damage by vehicles or stored product;
- Details of suitable facilities to receive excess waste wash water used in the process to include recovery of solid material; and
- Details of the prevention of waste water arising from the washing processes entering the dock.
- The development shall operate in accordance with the approved operational plan.

Reason: To ensure that the development hereby approved does not result in unacceptable levels of noise transmission or pollution to neighbouring premises and / or the surrounding area.

- 8.8.9 With ambient and background noise levels relatively low, any future occupation of the currently vacant industrial units could have a noise impact on residential amenity. There are no details available regarding the expected noise emissions from the glass recycling facility.
- 8.8.10 At detailed design stage, the facade of the of the student accommodation building would need to be designed to consider any noise impacts from the glass recycling facility as well as from any other noise sources so as to achieve the required indoor target noise levels.

Operational Plant (BS4142)

- 8.8.11 There is a potential for noise impacts from any fixed plant to be installed on site. It is possible that plant such as air conditioning units would be installed on site.

- 8.8.12 At detailed design stage, further studies would be undertaken to agree noise limits for plant to be installed on site with the local EHO, and ensure that the design meets these limits. The key issue would be to achieve a level below the night-time background (L_{A90}) noise level.
- 8.8.13 Based on measured daytime and night-time background noise levels the following noise limits are indicated for commercial operations and fixed plant:
- 8.8.14 35dB L_{Aeq} daytime (0700-2300hrs) and night time (2300-0700hrs)
- 8.8.15 This criterion is to be met with all proposed plant operating normally and must take into account penalties for acoustic features of the plant to be installed as set out in Table 4-4. A 'quota' may therefore need to be allocated to each commercial tenancy to ensure the overall level meets the proposed environmental noise criterion. Acoustic design criteria and noise limits for operational plant to be installed on site would be dealt with by Condition at detailed design stage.
- 8.8.16 Once the details for the proposed glass recycling facility are known, potential noise impacts from this facility would need to be considered in accordance with BS4142.
- 8.8.17 Further assessment may be required to reflect any recommendation, decision or condition imposed.

Construction Noise Assessment

- 8.8.18 Based on measured ambient noise levels the site would fall under 'Category A' of BS5228-1 and the following noise limits are therefore indicated for construction noise:
- 65dB L_{Aeq} daytime (0700-1900hrs, Sat: 0700-1300hrs)
 - 55dB L_{Aeq} evening and weekends (Weekdays 1900-2300hrs, Sat: 1300-2300hrs, Sundays 0700-2300hrs)
 - 45dB L_{Aeq} night-time (2300-0700hrs)
- 8.8.19 At this stage there is no construction information available to allow for the assessment of the construction noise impacts. In the absence of construction information, an indicative programme based from experience on similar developments has been considered.
- 8.8.20 The construction noise levels have been predicted with distance from source by using the measured $L_{Aeq\ 1hr}$ using the following formula as described in BS5228:
- $K_h = 20 * \log_{10} (R/10)$

Where

- K_h = the correction for propagation across hard ground
 - R = the distance to the receptor location
 - 10 = the distance in m at which the sound pressure level from the plant has been measured, as recorded in the Tables in BS5228.
- 8.8.21 The sound pressure levels (L_p) in BS 5228 have been presented as a L_{Aeq} at a distance of 10 m (Table 5-10). It has been assumed that plant would be operating for long periods of time ("percentage on-time") so as to present a possible worst case.

Plant	BS5228 Table Reference	Percentage On Time	L_p at 10m (L_{Aeq} dB)
Hammer Piling	Table C3 No.1	60	89

Tracked Excavator	Table C.5 No. 18	70	80
Dozer	Table C.5 No. 12	60	77
Dumpers	Table C4 No. 9	60	77
Vibratory Roller (22t)	Table C5 No. 28	60	77
Asphalt Paver	Table C5 No. 33	60	75
Diesel Generator	Table C4 No. 84	100	74
Delivery Lorry	Table C.2 No.35	70	80
Tracked Mobile Crane	Table C4 No.52	60	75
Telescopic Handler	Table C4 No.54	75	79
Wheeled Loader	Table C2 No. 26	75	79
Tower Crane	Table C4 No.49	60	77
Concrete Saw	Table C4 No. 71	10	85
Compressor	Table C5 No.5	80	75
Excavator	Table C5 No.34	75	82
Roller Compactor	Table C.5 No.29	60	76
Water Pump	Table C.2 No.45	75	65
Concrete Pump & Concrete mixer truck discharging	Table C.4 No. 28	80	79
Poker Vibrator	Table C.4 No. 33	80	78
Percussion Drill	Table C4 No. 69	40	85
Circular Saw	Table C4 No.72	40	79
Angle Grinder	Table C4 No.93	40	80
Welder	Table C3 No.31	40	73

Table 8.10 List of construction plant and associated sound pressure level ($L_{Aeq,T}$) in dB at 10m

- 8.8.22 Construction noise impacts will depend on the distance of works from receptor locations, therefore noise impacts have been predicted at distances of 50m, 100m and 200m from the works. North of the site, there are multi-storey apartments on Kings Road immediately opposite the development site, approximately 30m the site boundary. There are also apartments on the Prince of Wales Dock that are approximately 75m from development site boundary. The distance between receptors and construction activities will vary as works move to various parts of the site. There will potentially be higher noise impacts at these receptors when works take place close to or at the site boundary.
- 8.8.23 To the south the closest residential dwellings are located approximately 170m from the site boundary on the opposite side of the river.
- 8.8.24 A possible worst case has been presented by considering propagation across hard ground and by not considering screening afforded by topographical features, buildings or other structures.
- 8.8.25 Construction will commence with mobilisation to site, involving delivery of plant and equipment and the preparation of site compounds. The noise impacts associated with this activity are shown in Table 8.11.

Plant	Number	Total SPL @ 10m	Total SPL @ 20m	Total SPL @ 50m	Total SPL @ 100m	Total SPL @ 200m
Delivery Lorry	4	84.5	78.5	70.5	64.5	58.5

Plant	Number	Total SPL @ 10m	Total SPL @ 20m	Total SPL @ 50m	Total SPL @ 100m	Total SPL @ 200m
Tracked Mobile Crane	1	72.8	66.8	58.8	52.8	46.8
Telescopic Handler	1	77.8	71.7	63.8	57.8	51.7
Wheeled Loader	1	77.8	71.7	63.8	57.8	51.7
Dozer	1	78.8	72.7	64.8	58.8	52.7
Dumpers	2	77.8	71.8	63.8	57.8	51.8
Diesel Generator	1	74.0	60.0	60.0	54.0	48.0
Total		87.6	73.6	73.6	67.6	61.6

Table 8.11 Predicted noise levels ($L_{Aeq,1hr}$) during mobilisation to site

- 8.8.26 Site clearance / enabling works would typically involve the use of earth moving equipment and dumpers. The associated noise impacts with distance from source are shown in Table 8.12.

Plant	Number	Total SPL @ 10m	Total SPL @ 20m	Total SPL @ 50m	Total SPL @ 100m	Total SPL @ 200m
Dumpers	2	78.5	72.4	64.5	58.5	52.4
Tracked Excavator	1	77.5	71.4	63.5	57.5	51.4
Lorry	1	78.5	72.4	64.5	58.5	52.4
Tower Crane	1	74.8	68.8	60.8	54.8	48.8
Dozer	1	74.8	68.8	60.8	54.8	48.8
Compressor	2	77.0	71.0	63.1	57.0	51.0
Diesel Generator	1	74.0	68.0	60.0	54.0	48.0
Total		85.2	79.2	71.2	65.2	59.2

Table 8.12 Predicted noise levels ($L_{Aeq,1hr}$) during site clearance

- 8.8.27 Noise impacts associated with the construction of buildings and other structures on site are shown in Table 8.13.

Plant	Number	Total SPL @ 10m	Total SPL @ 20m	Total SPL @ 50m	Total SPL @ 100m	Total SPL @ 200m
Tracked Excavator	1	77.5	71.4	63.5	57.5	51.4
Diesel Generator	1	72.0	66.0	58.0	52.0	46.0
Dumpers	1	74.8	68.8	60.8	54.8	48.8
Telescopic Handler	1	77.8	71.7	63.8	57.8	51.7

Plant	Number	Total SPL @ 10m	Total SPL @20m	Total SPL @ 50m	Total SPL @ 100m	Total SPL @ 200m
Concrete Pump & Concrete mixer truck discharging	1	78.0	72.0	64.1	58.0	52.0
Poker Vibrator	2	80.0	74.0	66.1	60.0	54.0
Tower Crane	2	77.8	71.8	63.8	57.8	51.8
Compressor	2	77.0	71.0	63.1	57.0	51.0
Hammer Piling	1	86.8	80.8	72.8	66.8	60.8
Total		88.9	82.9	75.0	68.9	62.9

Table 8.13 Predicted noise levels (LAeq,1hr) during construction of buildings

- 8.8.28 Construction activities produce significantly high noise levels, particularly close to source. Construction noise tends to fluctuate and is usually of fairly short duration. The construction noise impacts will depend on the proximity of construction activities to nearby receptor locations.
- 8.8.29 The construction noise impacts predicted above indicate that the highest impacts occur within 200m of the site, and these are expected to be below the significant construction noise limit of 65 dB(A). The multi-storey apartments on Kings Road would potentially be exposed to higher noise levels, with upper floors having a clear line of site to construction works. The predicted noise levels are based on a possible worst case scenario assuming all plant will operate simultaneously at the same location. Propagation across hard ground has been assumed and no screening from topographical features or other structures has been assumed.

8.9. Traffic Noise

- 8.9.1 Outline planning approval has been obtained for redevelopment of the SA1 area in 2003, permission being superseded in 2010 via a variation of condition application and Environmental Statement addendum.
- 8.9.2 The change in the illustrative distribution of the proposed development mix across SA1 would result in changes in traffic volumes and the associated traffic noise levels. Since planning approval has been granted for the 2010 Masterplan scheme, based on the traffic data as presented in the ES Addendum, this assessment considers the change in traffic volumes associated with the revised land use plan for SA1 and the associated change in noise level.
- 8.9.3 Revised traffic data (expressed as 18 hour AAWT data) has been provided for the following links to consider the change in noise level.

Arm	2015 With 2010 SA1		2015 With 2015 SA1		2025 With 2010 SA1		2025 With 2015 SA1	
	Volume	% HGV	Volume	% HGV	Volume	% HGV	Volume	% HGV
Fabian Way (west of Port	41677	3.5	41662	3.5	46843	3.5	46828	3.5

Tennant Road)								
Port Tennant Road	5043	3.0	5040	3.0	5635	3.0	5632	3.0
Fabian Way (between Port Tennant Road and McDonalds Jct)	45303	3.3	45273	3.3	50243	3.4	50213	3.4
Langdon Road (between Fabian Way and roundabout)	15080	2.0	15037	2.0	15080	2.0	15037	2.0
Park and Ride	1192	4.9	1192	4.9	1367	5.0	1367	5.0
Fabian Way (east of P&R)	53287	3.2	53232	3.2	58192	3.3	58137	3.3
McDonalds Access Road	16311	2.0	16282	2.0	17177	2.1	17148	2.1

Table 8.14 Traffic Data for the 2010 and proposed 2015 SA1 layout (18 hour AAWT)

- 8.9.4 The traffic data in Table 8-14, provided by Hyder traffic engineers who authored the Transport Assessment, indicate that the 18 hour AAWT traffic volumes for the proposed SA1 layout in 2015 will be slightly lower than for 2010. The $L_{A10\ 18\ hour}$ for each of the scenarios above has been calculated in accordance with CRTN.
- 8.9.5 The traffic noise levels ($L_{A10, 18\ hour}$) for the 2010 SA1 Masterplan layout and the revised SA1 layout for 2015 are presented in Table 8.15.

Arm	$L_{10\ 18hr}$ in 2015 with 2010 SA1	$L_{10\ 18hr}$ in 2015 with 2010 SA1	Difference
Fabian Way (west of Port Tennant Road)	72.5	72.5	0
Port Tennant Road	63.4	63.4	0
Fabian Way (between Port Tennant Road and McDonalds Jct)	72.9	72.9	0
Langdon Road (between Fabian Way and roundabout)	68.2	68.2	0
Park and Ride	57.1	57.1	0
Fabian Way (east of P&R)	73.6	73.6	0

McDonalds Access Road	68.3	68.3	0
-----------------------	------	------	---

Table 8.15 Comparison of $L_{A10\ 18\ \text{hour}}$ traffic noise levels in 2015 for SA1 2010 and SA1 2015

- 8.9.6 Table 8-15 indicates that the traffic volumes for the revised 2015 layout will not result in any change to the predicted traffic noise levels for the 2010 SA1 layout for which planning permission has been granted. Therefore in terms of the criteria in DMRB in Table 8-6, in the short term, there would be no change to the magnitude of impact.
- 8.9.7 The change in traffic noise level in the long term (2025) for the original SAA1 layout in 2010 and the revised 2015 layout has also been considered. The traffic noise levels ($L_{A10\ 18\ \text{hour}}$) for the 2010 SA1 Masterplan layout and the revised SA1 layout for 2025 are presented in Table 8-16.

Arm	$L_{10\ 18\text{hr}}$ in 2015 with 2010 SA1	$L_{10\ 18\text{hr}}$ in 2015 with 2010 SA1	Difference
Fabian Way (west of Port Tennant Road)	73.1	73.1	0
Port Tennant Road	63.9	63.9	0
Fabian Way (between Port Tennant Road and McDonalds Jct)	73.3	73.3	0
Langdon Road (between Fabian Way and roundabout)	68.2	68.2	0
Park and Ride	57.7	57.7	0
Fabian Way (east of P&R)	74.0	74.0	0
McDonalds Access Road	68.5	68.5	0

Table 8.16 Comparison of $L_{A10\ 18\ \text{hour}}$ traffic noise levels in 2025 for SA1 2010 and SA1 2015

- 8.9.8 Table 8-16 indicates that, in the long term (2025), the traffic volumes for the revised SA1 layout will not result in any change to the predicted traffic noise levels as predicted for the 2010 SA1 layout for which planning permission has been granted. Therefore in terms of the criteria in DMRB in Table 8-6, in the long term, there would be no change to the magnitude of impact.
- 8.9.9 Revised traffic data for the peak period for the 2010 SA1 layout and 2015 SA1 layout is presented in Table 8-17. The traffic data in Table 8-17 indicates that for the 2015 SA1 layout traffic volumes will be slightly higher in the peak period.

AM Peak (0800-0900)				
Arm	2015 With 2010 SA1	2015 With 2015 SA1	2025 With 2010 SA1	2025 With 2015 SA1
Fabian Way (west of Port Tennant Road)	3403	3458	3815	3870
Port Tennant Road	414	426	457	469
Fabian Way (between Port Tennant Road and McDonalds Jct)	3844	3956	4239	4351
Langdon Road (between Fabian Way and roundabout)	1571	1730	1571	1730

Park and Ride	111	111	127	127
Fabian Way (east of P&R)	4706	4905	5104	5303
McDonalds Access Road	1597	1704	1676	1783
PM Peak (1600-1700)				
Arm	2015 With 2010 SA1	2015 With 2015 SA1	2025 With 2010 SA1	2025 With 2015 SA1
Fabian Way (west of Port Tennant Road)	3354	3380	3757	3783
Port Tennant Road	454	460	504	510
Fabian Way (between Port Tennant Road and McDonalds Jct)	3738	3788	4123	4173
Langdon Road (between Fabian Way and roundabout)	1436	1508	1436	1508
Park and Ride	79	79	91	91
Fabian Way (east of P&R)	4478	4567	4857	4946
McDonalds Access Road	1375	1424	1432	1481

Table 8.17 Peak Traffic Data for the 2010 and proposed 2015 SA1 layout (1 hour AAWT)

8.9.10 A basic noise level (BNL) has been calculated for each of the above scenarios in accordance with CRTN and presented in Table 8.18 below.

AM Peak (0800-0900)						
Arm	2015 With 2010 SA1	2015 With 2015 SA1	Difference	2025 With 2010 SA1	2025 With 2015 SA1	Difference
Fabian Way (west of Port Tennant Road)	77.5	77.6	0.1	78.0	78.1	0.1
Port Tennant Road	68.4	68.5	0.1	68.8	68.9	0.1
Fabian Way (between Port Tennant Road and McDonalds Jct)	78.0	78.2	0.1	78.5	78.6	0.1
Langdon Road (between Fabian Way and roundabout)	74.2	74.6	0.4	74.2	74.6	0.4
Park and Ride	62.7	62.7	0.0	63.2	63.2	0.0
Fabian Way (east of P&R)	78.9	79.1	0.2	79.3	79.4	0.2
McDonalds Access Road	74.2	74.5	0.3	74.4	74.7	0.3
PM Peak (1600-1700)						
Arm	2015 With 2010 SA1	2015 With 2015 SA1	Difference	2025 With 2010 SA1	2025 With 2015 SA1	Difference
Fabian Way (west of Port Tennant Road)	77.5	77.5	0.0	77.9	78.0	0.0

Port Tennant Road	68.8	68.8	0.1	69.2	69.3	0.1
Fabian Way (between Port Tennant Road and McDonalds Jct)	77.9	78.0	0.1	78.4	78.4	0.1
Langdon Road (between Fabian Way and roundabout)	73.8	74.0	0.2	73.8	74.0	0.2
Park and Ride	61.2	61.2	0.0	61.8	61.8	0.0
Fabian Way (east of P&R)	78.7	78.8	0.1	79.1	79.1	0.1
McDonalds Access Road	73.6	73.7	0.2	73.8	73.9	0.1

Table 8.18 Basic Noise Level for Peak Period for 2010 SA1 layout and 2015 SA1 Layout

- 8.9.11 In the short term (2015) and the long term (2025), when compared with the 2010 Masterplan layout the change in noise levels during peak traffic associated with the 2015 SA1 layout indicates an increase of less than 1dB. The largest increase in noise is 0.4 dB on Langdon Road during the AM peak.
- 8.9.12 An increase of 0.4 dB in the short term and long term, according to the criteria in DMRB (Table 8-6 and Table 8-7) would be considered 'Negligible'.

8.10. Recommendations

- 8.10.1 At this time, the location and orientation of rooms within the development are unknown. It is advised that all properties are orientated at the detailed planning stage to ensure sensitive rooms such as living rooms and bedrooms are positioned facing away from the industrial units to the south east.
- 8.10.2 The need for acoustic design of the building is in line with the recommendations made in B6 of the 2010 ES Addendum Report and is in line with the 2010 planning conditions. The planning conditions related to noise are reviewed and considered in light of this assessment in Table 8-19.

Number	Condition Timing	Summary of Condition 2010	Revised Condition 2015
16	General Compliance	The mitigation measures in respect of noise and vibration identified in Section B6 of the Environmental Statement and Addendum Environmental Statement shall be incorporated into the development proposals and processes unless otherwise agreed in writing with the Local Planning Authority.	No Change
17	In accordance with Phasing Programme	The urban design guidance to be approved pursuant to conditions 4 and 5 shall address the issue of noise (i.e. unwanted sound), noise avoidance and noise attenuation within the development. Reserved matters applications shall accord with this guidance.	No Change

Table 8.19 Review of 2010 Planning Conditions

- 8.10.3 Noise from outside a building can enter a room through windows, ventilators, walls, roof and doors. In most cases, windows provide the main path and it is therefore important to ensure that their insulation is specified correctly.
- 8.10.4 Fixed plant to be installed on site would need to operate at noise levels that ensure noise levels are 10dB(A) below the background noise level. Current background noise levels indicate that plant noise would need to be below 35 dB(A) at the closest receptor. The appropriate design of fixed plant will be considered at detailed design stage.
- 8.10.5 Methods of construction are as yet unknown, however best practicable means should be used as to ensure noise from each of these processes is minimised.
- 8.10.6 In accordance with good working practices, the principles of the “best practicable means” (BPM), as defined in the Control of Pollution Act (1974) should be used to reduce noise and vibration emissions throughout the demolition and construction periods. This should incorporate the use of measures to control noise and vibration that do not unreasonably inhibit the work, and the use of working methods that result in minimum effects compatible with normal working practices.
- 8.10.7 Noise control measures consistent with good working practices should be implemented during the construction phase. Noise and vibration control measures could be implemented within a Construction Environmental Management Plan (CEMP) in consultation with the Council.
- 8.10.8 Particular care would be required in the vicinity of residential properties, for example by using quieter, well maintained plant working close to receptors. Liaison with EHO should take place prior to commencement of construction to ensure that appropriate and adequate means of mitigation are applied throughout the construction work. Routine forms of noise and vibration control should be implemented during all phases of construction work. Control measures routinely applied in this way are likely to include the following:
- the use, where necessary and practicable, of enclosures and screens around noisy fixed plant which can typically reduce noise levels by more than 10 dB(A) subject to their design, height and location relative to the source and the receptor. The upper floors at the multi-storey apartments on Kings Road would receive little or no benefit from acoustic screens placed at construction works.
 - properly maintaining/servicing plant used
 - limiting site work where possible to daytime hours, i.e. 07:00-19:00 hours Monday to Friday, 07:00-13:00 hours on Saturdays, and no working on Sundays or Bank Holidays without prior consultation with the EHO
 - adhere to relevant standards, such as BS 5228 ‘Noise and vibration control on construction and open sites’
- 8.10.9 The changes to traffic volumes associated with the proposed 2015 SA1 layout present L_{A10} 18 hour noise levels that are the same as those for the 2010 SA1 layout for which planning approval has been granted.

8.11. Conclusion

- 8.11.1 Ambient noise surveys indicate that at night, the parts of the application site the subject of revised development proposals would fall within NEC B. Baseline noise surveys carried out on site indicate that residential development would be possible with the incorporation a minimal level of mitigation into the design of the building envelope to meet acceptable internal noise levels. It is however noted that the Council has received a planning application for a glass recycling facility to the south east of the site. The design of the building façade of the residential component would need to consider future noise impacts from industrial type uses.
- 8.11.2 Current background noise levels indicate that plant noise would need to be below 35 dB(A) at the closest receptor. The appropriate design of fixed plant to be installed on site will be considered at detailed design stage.
- 8.11.3 Noise control measures consistent with good working practices should be implemented during the construction phase. Noise and vibration control measures could be implemented within a Construction Environmental Management Plan (CEMP) in consultation with the Council.
- 8.11.4 The revised SA1 site layout will result in a negligible change in traffic noise in the short term and long term when compared with traffic noise levels for the 20110 SA1 layout for which planning approval has been granted.
- 8.11.5 The 2010 planning conditions would remain valid, requiring that mitigation measures be incorporated into the building facade design at detailed design stage. Mitigation measures such as selection of appropriate glazing are commonly used in building design to ensure that target indoor noise levels are achieved and related planning conditions are met.

8.12. References

- 8.12.1 Ref 1 Planning Policy Wales 2014
- 8.12.2 Ref 2 Technical Advice Note (Wales) 11 – Noise (TAN 11)
- 8.12.3 Ref 3 British Standards Institute (2014) Sound insulation and noise reduction for buildings - code of practice. BS8233: 2014.
- 8.12.4 Ref 4 Unitary Development Plan (UDP) 2008, City and County of Swansea
- 8.12.5 Ref 5 The Swansea Local Development Plan Preferred Strategy 2013
- 8.12.6 Ref 6 The County and City of Swansea Residential Design Guide (adopted January 2014)
- 8.12.7 Ref 7 WHO (1999) Guidelines for Community Noise World Health Organisation. Geneva 2000
- 8.12.8 Ref 8 WHO (2009) Night Noise Guidelines for Europe' Copenhagen 2009
- 8.12.9 Ref 9 British Standards Institute (2014). Methods for rating industrial and commercial sound. BS 4142: 2014.
- 8.12.10 Ref 10 British Standards Institute (2014). Code of practice for noise and vibration control on construction and open sites. BS 5228:2009 +A1 2014
- 8.12.11 Ref 11 Highways Agency (2011) Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 7 HD213/11 'Noise and Vibration' Detailed Assessment methodology (HD213/11) (Ref 11).

8.12.12 Ref 12 Department of Transport and Welsh Office (1988). Calculation of Road Traffic Noise (CRTN).

9. Ecology

9.1. Introduction

- 9.1.1 The focus of this second addendum report is an assessment of ecological impacts associated with particular elements of the SA1 Swansea Waterfront Site. The areas of land considered in this assessment are known as the former Leisure Quarter (also known as the SA1 Peninsula), Plots E (E6 to E9), Plot F, Plot A15 and Plot A16 located adjacent to the Prince of Wales Dock. The land affected by these developments is referred to as the survey area within this report.
- 9.1.2 A significant proportion of the infrastructure associated with the 2003 consent has been built, with the remaining areas cleared of vegetation and buildings in preparation for re-development.
- 9.1.3 The scope of this report comprises:
- A review of information collected in baseline ecological surveys pertaining to the survey area that were undertaken by Hyder Consulting in October 2014 (report dated November 2014, presented in Appendix 9.1 of this report).
 - An evaluation of the survey area in terms of their current nature conservation value.
 - An assessment of the potential ecological impacts of the proposed re-development of the Survey Area.
 - Proposed mitigation measures identified in respect of any identified adverse impacts.
 - Identification of residual impacts taking into account all proposed mitigation measures.
- 9.1.4 Other plots that have yet to be developed and to be reported on a later date include plots A9, A11a, A11c, A14B/A17, B3, and D8/E1.

9.2. Survey methodology

Pre-2014 surveys

- 9.2.1 The following surveys have been undertaken on site and the results provided in the WAES 2002 and subsequent ecological reports:
- A Phase 1 ecology survey of the site undertaken by Hyder Consulting in March 2001 on behalf of the Welsh Development Agency (WDA);
 - An otter survey undertaken by the Otter Consultancy in 2002;
 - Phase 2 National Vegetation Classification (NVC) surveys of habitat on site undertaken in 2002; and
 - Surveys for bat, reptile, terrestrial and wintering birds, and invertebrates, undertaken by Price Consultants in 2002.

Updated Survey

- 9.2.2 An ecological appraisal of the site was undertaken by Hyder Consulting in 2014 and comprised a walkover survey and a desk study. The walkover survey was undertaken on 17th October 2014 and involved an extended Phase 1 habitat survey to confirm whether conditions within the survey area had changed since the ecological survey carried out in 2010. This survey focused on validating existing habitat data, and checking for signs of protected species. As part of the desk study information was obtained from the South East Wales Biological Records Centre (SEWBRc).
- 9.2.3 The full details of the methodology used to inform the appraisal are presented in the Ecological Appraisal report (Hyder, November 2014). It should be noted that the SA1 peninsular was still known as the Leisure Quarter and has been referred to as such throughout the report.

9.3. Baseline Conditions

- 9.3.1 A summary of the 2014 ecological appraisal, which includes a review of the historical information, is presented below.

Statutory Designated Sites

- 9.3.2 The desk study revealed that there is one Special Area of Conservation (SAC) within 5km of the survey area and three Sites of Special Scientific Interest (SSSI) within 2 km, as identified below.
- 9.3.3 Crymlyn Bog Special Area of Conservation (SAC) is located approximately 860 m to the northeast of the SA1 development at the closest point. The SAC comprises two component Sites of Special Scientific Interest (SSSI), Crymlyn Bog SSSI and Pant-y-Sais SSSI. Crymlyn Bog is also a designated Ramsar; Crymlyn Bog and Pant-y-Sais are notified as National Nature Reserves (NNR) and Pant-y-Sais is a Local Nature Reserve (LNR). Habitats in these areas include fen and swamp communities, and include a population of the nationally rare plant species, Slender Cottongrass (*Eriophorum gracile*).
- 9.3.4 The Glamorgan Inventory of Ancient Woodland (Provisional) identifies a small area of ancient semi-natural woodland close to the eastern edge of Kilvey Hill, next to Crymlyn Bog, approximately 1.5 km to the northeast of the development areas.
- 9.3.5 Blackpill/Swansea Bay SSSI is located approximately 2 km to the south-west of the site. Previous assessments and consultation surrounding the site also indicate that otters are present within the locality with historic records from the Tennant Canal that adjoins Pant-y-Sais SSSI and in 2002 it was believed that otters were also using the River Tawe.
- 9.3.6 It is considered unlikely that the development proposals would have a significant effect on the designated sites or their associated species due to the distance between these sites and the development area and the lack of any identified impact pathways. These sites have not been considered further in this addendum.

Plants and Habitats

- 9.3.1 The desk study biological records search revealed records for plant species of conservation concern within and adjacent to the development site. Species recorded in the vicinity of the Prince of Wales Dock include Slender Rush (*Juncus tenuis*), Common Centaury (*Centaureum erythraea*), Sea-buckthorn (*Hippophae rhamnoides*) and Common Broomrape (*Orobancha minor*). None of these species were identified during the 2014 Extended Phase 1 Survey and no suitable habitat for these species was identified. These species are considered unlikely to be present.

9.3.2 In 2014, most of the plots supported very little vegetation other than small areas of regenerating Butterfly-bush (*Buddleja davidii*). Plots E7 and E8 supported improved grassland. Plot E8 also contained some shallow scrapes with water that did not support any aquatic plants and appeared to hold rain water that would evaporate at other times of the year. Plots A15 and A16 contain areas of low-growing ephemeral vegetation with dense Bramble (*Rubus fruticosus* agg.) and Butterfly-bush scrub. The River Tawe is located to the west of the survey area, with the Prince of Wales Dock between Plots A15/16 and Plots E and F. Kings Dock is located to the south of Plots E and F. Neither the River Tawe nor the Docks support aquatic plants.

9.3.3 Plots E7, E8 and E9 supported stands of the non-native invasive plant species Japanese Knotweed (*Fallopia japonica*). The Leisure Quarter/ SA1 peninsular did not support any habitats of ecological value having been cleared in preparation for re-development, with some areas used as a surface level car park.

Amphibians

9.3.4 Three shallow, ephemeral waterbodies were identified in Plot E8. These waterbodies were not sufficiently deep to be used by breeding amphibians, in particular great crested newts (*Triturus cristatus*).

Reptiles

9.3.5 Desk study information received from SEWBReC revealed that common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*) and grass snake (*Natrix natrix*) are present in the local area.

9.3.6 During the extended Phase 1 habitat survey Plots E7 and E8 and the bund located along the southern boundary of Plot E9 and F were the only locations identified as supporting habitat suitable for use by reptiles (see Ecological Appraisal Report Hyder 2014, Target Note (TN) 5 and Figure 002-UA001793-01 and TN6 Figure 003-UA001793-01). These two locations supported grassland and tall ruderal herbs that provided suitable reptile basking and foraging habitat. Previously stockpiled material which had become colonised by vegetation also provided suitable habitat for hibernation. Given the extent of redevelopment and activity that has occurred within the SA1 site as a whole, any reptile assemblages are likely to be isolated populations supporting a small number of individuals.

9.3.7 It is considered that an isolated population of reptiles may exist within Plots E7, E8 and E9.

Birds

9.3.8 The desk study revealed many records of birds within 2km of the survey area. This included records of bird species listed on Schedule 1 of the Wildlife and Countryside Act (1981 as amended). There were also records of roosting black-headed gull (*Chroicocephalus ridibundus*) within the survey area; black-headed gulls are a species of principal concern for conserving biodiversity as listed under Section 42 of the Natural Environment and Rural Communities (NERC) Act (2006).

9.3.9 During the walkover survey very little bird activity was observed across the survey area as a whole. Plots E7, E8, E9, F, A15 and A16 contained small areas of scrub suitable for use by nesting birds (plots shown on Figure 002-UA001793-01, Figure 003-UA001793-01 and Figure 004-UA001793-01).

9.3.10 In 2010, the Leisure Quarter /SA1 peninsular (Figure 007-UA001793-01) was identified as an area of hard standing. This was still the case in October 2014. However, as illustrated by images 16 and 17 in Appendix 9.1, ephemeral vegetation has begun to regenerate and there were areas of shallow standing water. The Leisure Quarter (east) was fenced preventing access. The combination of ephemeral vegetation, standing water and lack of disturbance has led to the creation of habitat in the Leisure Quarter potentially suitable for ground nesting birds.

Protected Mammals

- 9.3.11 Surveys undertaken in 2002 (to support the WAES) concluded that the survey area was of negligible value for foraging bat species. The 2014 survey revealed that the survey area continued to support habitats of limited value to foraging bats, see the report in Appendix 9.1.
- 9.3.12 The survey area supported habitats of limited value to badgers (*Meles meles*) and it is considered unlikely that they are present. Similarly, there was no freshwater on site suitable for foraging otters (*Lutra lutra*) and it is considered unlikely that they are present.

9.4. Nature Conservation Assessment

Criteria for Nature Conservation Assessment

- 9.4.1 The assessment of the nature conservation value of the survey area has been based on the 2010 Phase 1 habitat survey update and the 2002 WAES baseline surveys and assessments. In 2002 the nature conservation value of the species and habitats on site was assessed in terms of international, national, regional/county, local (parish) and negligible importance.
- 9.4.2 Reference is also made to habitats and species which are listed under Section 42 of the NERC Act (2006) and RSPB/BTO list of Birds of Conservation Concern (BOCC).

Plants and Habitats

- 9.4.3 No plant species or habitats listed under Section 42 of the NERC Act were identified within the survey area. Stands of the invasive plant Japanese Knotweed were identified in Plots E7, E8 and E9.
- 9.4.4 It was concluded that the plants and habitats identified were of, at most, local nature conservation importance.

Amphibians

- 9.4.5 The vegetation in Plot E8 may support, at most, a small isolated population of amphibians. Overall, the survey area was considered to be of negligible importance for amphibian species.

Reptiles

- 9.4.6 Given the extent of redevelopment and activity that has occurred within the survey area as a whole, any reptile assemblages are likely to be isolated populations consisting of, at most, a small number of individuals only. It is considered that an isolated population of reptiles may exist within Plots E7, E8 and E9 but that the survey area is likely to be of, at most, local nature conservation importance for reptile species. Common reptile species are listed as species of principal importance for conserving biodiversity as identified in Section 42 of the NERC Act (2006).

Birds

- 9.4.7 Plots E7, E8 and the Leisure Quarter supported habitat potentially suitable for a limited range of common bird species. The survey area is considered to be of, at most, local nature conservation value for breeding bird species.

Protected Mammals

- 9.4.8 The survey area is considered to be of negligible importance for bats, badgers and otters.

9.5. Assessment of Potential Impacts

Impact Assessment Criteria

- 9.5.1 In 2002, the assessment of the impacts of the proposed development took into account on-site effects and effects which may affect adjacent areas of nature conservation value. In 2010, the potential future impacts on the remaining habitats and species were assessed in a similar manner; this procedure has been followed in 2015.
- 9.5.2 Impacts on ecological receptors can be permanent or temporary and may include:
- Direct loss of wildlife habitats, including the loss of foraging areas, shelter and roost sites and breeding areas;
 - Fragmentation and isolation of habitats, leading to a reduction in resources on site to support populations;
 - Disturbance to species, such as those associated with temporary construction activities, and long-term post-development disturbance;
 - Changes to the local hydrology and/or water quality as a result of activities on site.
- 9.5.3 In order to ensure consistency the impact assessment criteria that was applied to the WAES and the 2010 addendum has been followed. This is summarised below:
- Major (or severe) impact - Loss of or permanent damage to any part of a nationally important site, or a substantial part or key feature of a site of county importance, or the whole of a site of local importance. Loss of a legally protected, nationally rare or nationally scarce species from the site or its immediate vicinity.
 - Moderate impact - Loss of or permanent damage to any part of a site of county importance, or a substantial part or key feature of a site of local importance. A substantial reduction in the numbers of legally protected, nationally rare, nationally scarce species on the site or its immediate vicinity. The loss of or very substantial reduction in the population of, a rare species (regional/county level) from the site or its immediate vicinity.
 - Minor impact - Loss of or permanent damage to any part of a site of local importance. A reduction in the population of legally protected, nationally rare, nationally scarce or rare (regional/county level) species on the site or its immediate vicinity.
 - Negligible impact - Temporary damage to a small part of a site of local importance or loss of or damage to land of negligible nature conservation value. No reduction in the population of legally protected, nationally rare, nationally scarce or notable (regional/county level) species on the site or its immediate vicinity.
- 9.5.4 Due to the limited extent of semi-natural habitat present within the survey area, the potential for significant effects on ecological receptors is considered to be minimal. Table 9.1, below, identifies the potential effects of the proposed development.

Table 9.1 Summary of Effects of the proposed development on ecological receptors

Ecological receptor	Potential impact	Nature Conservation Importance (International/ National/ Regional/ District/ Local	Scale /magnitude of impact in the absence of mitigation measures

River Tawe and adjacent docks	Pollution arising from surface water runoff from the construction site lowering water quality. Pollution arising from fuel and other spillage from plant and construction activities.	Local	Moderate
A small population of reptiles within Plots E7, E8 and E9	Loss of habitat used for foraging and features used for hibernation. Incidental injury or mortality from plant and other construction activities.	Local	Minor
Ground nesting birds present within the Leisure Quarter / SA1 peninsular and Plots E7 and E8	Loss of habitat used for foraging and nesting. Incidental injury or mortality from plant and other construction activities. Disturbance from construction activities, whilst nesting.	Local	Minor
Japanese Knotweed within Plots E7, E8 and E9	Construction activities could potentially aid the spread of this plant.	Local	Minor

9.6. Mitigation measures

9.6.1 As the SA1 scheme has developed the mitigation measures that have been undertaken have been based on:

- Avoidance - through relocation, re-design or changes in construction programme;
- Reduction - involving lessening the severity of an impact which cannot be avoided; and

- Compensation - through habitat creation or enhancement.
- For consistency the same approach will be adopted in this report. Note that the mitigation measures described pertain to the potential ecological impacts identified with the survey area.

Water Quality

- 9.6.2 Mitigation measures should be put in place in order to avoid adverse effects on water quality within the River Tawe and the adjacent docks. The measures were set out in section B3 of the WAES (Hydrology and Drainage) and should be referred to for the more detailed mitigation measures that have been, and will continue to be employed during site construction and development. For ease of cross-reference they have been presented below:

'Construction Phase

The main potential for impact during demolition and construction works at the site is due to possible accidental spillages or leaks on the site. To mitigate the risk of pollution, the works at the site will be carried out following the development of a Pollution Control Strategy prepared in accordance with Environment Agency guidelines such as "Pollution Prevention Guideline 6: Working at Construction and Demolition Sites". This document provides guidance on good site management practices, including:

- Storage of materials in secure containers in safe locations;
- No waste products or packaging should be burnt on the site;

- 9.6.3 *Fuel to be used for construction plant stored in tanks which will be temporarily bunded with 110% of the tanks capacity. Refuelling points located within the bunded area and all tanks securely locked when not in use. Construction should follow guidance by the Construction Industry Research and information Association (CIRIA Report 163, The Construction of Bunds for Oil and Storage Tanks).*

Built Environment

The risk of flooding of buildings on the site from tidal inundation on the site may be mitigated by adopting appropriate foundation / house designs and ensuring that the finished level of floor slabs is set above the level likely to be reached by any flood waters.

As the redevelopment is likely to result in a decrease in permeable areas and it is likely that the existing surface water drainage infrastructure will be capable of accommodating the flows from the new development mitigation of surface water runoff is unlikely to be required. However in the interests of sustainability, during the detailed design process consideration may be given to the use of porous paving in hardstanding areas to increase the potential for infiltration, and the use of soakaways/ infiltration trenches to receive surface runoff. These two options would be in accordance with the principles of sustainable urban drainage, as set out by the Environment Agency in its publication "A Guide to Sustainable Urban Drainage".

- 9.6.4 In summary, construction operations close to the watercourses will continue to be managed so that all input of sediment and potential contaminants is avoided. This will be achieved through undertaking construction operations following best practice guidelines in accordance with a Construction Environmental Management Plan. Further details on pollution prevention are provided in Chapter 5 Hydrology and Drainage.

Reptiles

- 9.6.5 A small isolated population of reptiles may exist within plots E7, E8 and E9. Common species of reptile are protected from deliberate killing and injury under Section 9 of the Wildlife and Countryside Act 1981 (as amended). For the purpose of this assessment, and, given the project timescales, it should be assumed that reptiles are present within these plots. Appropriate mitigation measures will include reptile translocation to a suitable receptor site location, details of which will be expanded upon in an ecology mitigation strategy that would be produced if reptiles are confirmed to be present within the survey area.
- 9.6.6 In order to confirm the presence, or otherwise, of a reptile population a reptile survey would be carried out prior to the commencement of further vegetation clearance. Such surveys are seasonally constrained and can only occur during the period when reptiles have emerged from hibernation (April to October inclusive). Should the presence of reptiles be identified a suitable receptor site will need to be identified to which the reptiles can be captured and moved to. Whether it is considered appropriate to create habitat suitable for reptiles within the proposed development or to move the reptiles to a suitable receptor site off-site will depend on both the size of the reptile population and on the detail of the development layout. It would not be appropriate, or sustainable, to retain a small reptile population on site that is isolated from larger areas of suitable habitat. If reptiles are found to be present on site a suitable mitigation strategy would be developed in accordance with a planning condition. This strategy would be subject to agreement with the local planning authority to ensure that the development does not have an adverse effect on reptiles.
- 9.6.7 If survey work does not confirm the presence of reptiles, then no mitigation measures would be required with respect to reptiles.

Breeding Birds

- 9.6.8 All species of birds are protected whilst nesting under the Wildlife and Countryside Act (1981, as amended). The nesting season is generally considered to be between 1 March and 31 August inclusive. The most appropriate mitigation measure is to phase construction activities that might disturb nesting birds to occur outside of the breeding period. Therefore, the removal of any vegetation and ground clearance works should be undertaken in the period September to February inclusive. If this is not possible, a walkover survey should be carried out by a qualified ecologist to confirm the absence of nesting birds. If nesting birds are found, works within the vicinity of the nest have to be delayed until the chicks have fledged. This typically takes 4 to 6 weeks depending on the state of the chick's development.
- 9.6.9 The phasing of development across SA1 has allowed for suitable nesting bird habitat to be retained in the short term for notable species such as song thrush (*Turdus philomelos*), while new planting has been established on site that will provide nesting opportunities going forward.

Japanese Knotweed

- 9.6.10 It is an offence under Section 14 of the Wildlife and Countryside Act 1981 (as amended) to encourage the spread of plants listed under Schedule 9 of the act this includes Japanese Knotweed. Therefore, prior to construction works a suitable knotweed eradication and control programme should be produced in accordance with Best Practice Guidelines. This may involve the appointment of a specialist contractor to carry out the eradication and control programme.

9.7. Residual Impacts

- 9.7.1 Assuming the successful implementation of the mitigation measures identified above it is considered that the development would have a negligible impact on the ecological resources, and the development would have no residual impact.

9.8. Habitat Enhancement

- 9.8.1 The Landscape Strategy that is included within the Design Code provides an overall guide as to how the landscape of the SA1 scheme will be developed. The landscape strategy provides the opportunity for habitat enhancement within the areas of public realm.
- 9.8.2 Such details will be developed as part of a detailed design stage and should include the creation of habitats of benefit to wildlife to ensure that the development leads to an enhancement in the value of the site for biodiversity in accordance with planning guidance and in keeping with the principals of sustainable development.

9.9. Cumulative Impacts

- 9.9.1 The consented Swansea Bay Tidal Lagoon project is not anticipated to result in any additional ecological effects with respect to the survey area. The land take associated with the infrastructure for the lagoon is distant from the SA1 scheme and separated from it by built development. The Lagoon project provides mitigation for impacts that it will have on terrestrial habitats and species. Although the Lagoon will affect tidal flows no effects on water flows are anticipated as a result of the SA1 scheme.

9.10. References

- 9.10.1 Hyder Consulting (November 2014 01-UA001793/UA007197-UWST-SA1-001). Welsh Government, Trinity St David's, SA1 Campus. Ecological Appraisal.

Refer to Appendix 9 for further details and figures.

10. Landscape and Visual Impact

10.1. Introduction

Purpose and status of document

- 10.1.1 This section provides an update to the Landscape and Visual Impact Assessment chapter of the Environmental Assessment, which was originally produced in 2002 and revised as an Addendum in 2010. The update assessment chapter will take into account the baseline conditions in 2014/15 and the revised masterplan proposals (2015) that form part of this variation of condition application.

Reference material

- 10.1.2 The following documents have been referred to for completing this chapter:

- Environmental Statement: Port Tawe Innovation Village – Section B8 Landscape and Visual Impact Wardell Armstrong June 2002
- Addendum Environmental Statement (AES): SA1 Swansea Waterfront – Section B8 Landscape and Visual Assessment - RPS Planning & Development April 2010
- Design Development Framework - RPS Planning & Development August 2004
- Detailed urban Design Guidance: Leisure Quarter - RPS Planning & Development August 2005

Methodology

- 10.1.3 This addendum accords with Advice Note 01/11, '*Photography and photomontage in landscape and visual assessment*' February 2011 and the updated GLVIA 3rd edition guidance. The updates to this are described further in the Methodology section 10.2. The key changes in methodology between the editions for the purpose of this LVIA are:

- Establishing the study area
- Defining receptors
- Produce Zone of Theoretical Visibility (ZTV)
- Cumulative effects
- Area of Landscape value and character – these have been determined (based on GLVIA guidance) on account of the scale of the site and lack of landscape character assessment due to the nature of the site: urban. Update of this assessment

Key changes from the 2010 AES masterplan proposals

- 10.1.4 On carrying out the assessment, the 2010 masterplan proposals will be compared with the new 2015 masterplan update, taking into account the main changes from the 2010 proposals which are predominantly:

- Focus on UWTSD owned sites – the application is being made on behalf of UWTSD and the Welsh Government and the proposals will change the use of the south western quadrant of SA1(also known as The Peninsula) from a ‘leisure quarter’ to a mixed use city quarter with university, commercial, retail, residential and hotel uses.
- Changes in floor areas, massing and building heights to the Peninsula area
- The new proposals will provide a maximum height of 12 storeys to the Peninsula area – the extant 2010 masterplan proposes a maximum of 10 storeys
- Updates to the layout of zones B, C, E and F

Glossary of terms

10.1.5 The ‘site’ or ‘SA1 development’ - the area defined within the planning application boundary

UDP – Unitary Development Plan for Swansea City and County 2008

2002 WAES – 2002 Warden Armstrong Environmental Statement.

2010 AES – 2010 RPS Environmental Statement Addendum

UWTSD – The Client: University of Wales Trinity Saint David’s.

Revised SA1 Masterplan – 2015 SA1 Waterfront Innovation Quarter Masterplan

ZTV – Zone of Theoretical Visibility.

10.2. Methodology

Previous Methodology

10.2.1 The original LVIA chapter of 2002 WAES and the 2010 AES were based on ‘Landscape Institute Advice Note 01/99 on Landscape and Visual Impact Assessment’ and ‘Guidelines for Landscape and Visual Impact Assessment (GLVIA) 2nd edition 2002.

10.2.2 As this chapter is an update to the 2010 AES, it will provide a critique of the current assessment reviewed against the changes, which are proposed within the new masterplan of 2015 and updated baseline data.

10.2.3 In order to make the update to this chapter comparable to the previous Addendum set, the Methodology described in Figure 10.4 will be followed, with notable additional elements to bring the methodology in line with GLVIA 3rd edition 2013.

10.2.4 Key changes from the 2nd to 3rd edition include the reinforcement of the distinction between landscape and visual effects the need to clarify whether effects are significant or not and an emphasis on proportionality in the extent of assessment required.

10.2.5 *“The emphasis should be on the identification of likely significant environmental effects, including those that are positive and negative, direct and indirect, long, medium and short term, reversible and irreversible, as well as cumulative effects.”*

10.2.6 Additional Methodology applied to this chapter for GLVIA 2013:

- Zone of Theoretical Visibility (ZTV) – In order to determine the study area. This is established by review of the revised proposals from the surrounding area with terrain based on topography only (by hand and eye). The proposals are assessed to a maximum parameter of 12 storeys high. This information will be used alongside other baseline findings to identify the Visual Receptors

- Summary of cumulative effects – an overview of the types of emerging development within the study area, the timescale and phasing for developments and an indication of other developments in the surrounding and adjacent areas which will have an impact on the development area as a whole

LVIA study area

- 10.2.7 With regards to the visual assessment, the previous assessments did not clearly define the study area other than by the choice of locations for the viewpoints. This chapter will review the existing viewpoints and will confirm the study area based on updated baseline data and by identifying the Zone of Theoretical Visibility (ZTV) through terrain based mapping (by hand and eye) while taking into account areas of urban development and significant vegetation.

Establishing receptors

- 10.2.8 Although they were not explicitly described, the visual receptors identified in the 2010 AES through choice of viewpoints include pedestrian routes, local residents, road users i.e. commuters and visitors, and local recreational areas or attractions to the area such as the Mumbles. The visual impact assessment generally states the magnitude of change to each view, however the sensitivity of the receptor was not clearly defined. This update will confirm the receptors to the views and state their sensitivity category, based on the Methodology established in Figure 10.4.

LPA scoping opinion

- 10.2.9 The content of the revised Addendum ES has been subject to a scoping opinion issued on 22nd December 2014 to City and County of Swansea. The response of 24th February 2015 acknowledged that the views established in 2010 would be updated as part of the Landscape and Visual Impact Assessment section. Feedback from the case officer has since confirmed that there is no requirement for providing any visualisations or Visual Verifiable Montages (VVM's) for this chapter.

Photographic Viewpoints

- 10.2.10 All the viewpoints included within the 2010 AES have been revisited and a new set of photographs have been taken in line with Advice Note 01/11, 'Photography and photomontage in landscape and visual assessment' February 2011. Key procedures followed are:
- Use of digital SLR camera (Nikon DX D60)
 - Identify locations with GPS device
 - Lens length manually set to 50mm
 - Single photographs used where appropriate and panoramic views used where wider views available, with the angle of view set to approximately 40 degrees as recommended within the guidance. Due to this some of the viewpoints are slightly wider than the 2010 AES versions.
 - Brief description of the weather and climate at the time of taking the photographs
- 10.2.11 Each of the view descriptions will include a summary of the following:
- Nature of change from the 2010 conditions
 - Nature of the receptor – who may experience the view
 - Nature of the view – direction, elevation, composition and characteristics of the view
 - Duration of the view – transient, sequence, temporary or permanent

- Importance of the view – account of highly valued or designated landscapes and recognised viewpoints
- Context – the site within the view

10.2.12 The GLVIA 3rd edition emphasises the focus on most significant views, be they positive or negative. During the review of the 2010 viewpoints the assessments will be compared in table form to allow for direct comparison between the two assessments. This will help to identify the key views which are considered to be of importance.

10.3. Baseline Information

2014 baseline data

10.3.1 An Initial Site Analysis Report has been completed in August 2014 which collates the current site data and has set the context of the masterplan area within the locality and planning policy parameters. The data that is pertinent to this chapter which has changed from the 2010 baseline has been summarised below.

New developments within the site since 2010

10.3.2 There are a small number of new developments within the site which have been constructed since the baseline information provided within the 2010 AES. Notably these are the Beacon Centre on block A13 and some of the residential terraces along the waterfront to D9, D10 and E4.

Landscape baseline

10.3.3 The existing vegetation within the SA1 Development is a mix of the typical vegetation to be found on a derelict dockland site and the more recent ornamental landscape associated with the new roads, developments and the public open space areas.

10.3.4 It is evident that the implemented schemes of the site area have taken reference from the Design Development Framework (2004) and the use of semi-mature street trees, ornamental shrub planting and robust hardy perennial mixes all support the urban fabric.

10.3.5 The scrub areas to empty plot sites consists of a mix of annual and perennial weeds and grasses, buddleia, gorse, bramble and shrubby willow.

Open space and hard landscape features

10.3.6 The empty plots are all derelict cleared dockland sites. Elsewhere on the site there is a mix of hard landscape elements within the public and private spaces. There have been no notable developed spaces since 2010.

10.3.7 It would appear that the principles as set out within the 2004 Design and Development Framework relating to materials have been adhered to, with a clean palette of granite paving and edges mixed with conservation paving. The 2004 document also includes reference to resin bonded gravel, which has been used for tree pit finishes. Service routes and main roads include a hierarchy of conservation paving slabs and edges combined with areas of tarmac and feature paving within the highway.

Roads and Public Rights of Way

10.3.8 Since the 2010 Addendum ES there have been a number of notable updates to public rights of way in the area:

1. The Wales Coast Path National Trail has been connected through the SA1 site and is therefore a new designated Public Right of Way within the site boundary.

2. In addition to this the Sustrans cycle route has been extended to connect along the site's Tawe river bank and over Trafalgar Bridge to Swansea beach and beyond.
3. Kilvey Hill Rights of Way - As part of the Swansea Ramblers Big Welsh Walk Festival (04.05.13) new Rights of Way were created by the council's Countryside Access Department giving legal recognition and protection to some of the paths on the hill which the public have walked for centuries.

Landscape Designations

- 10.3.9 A full summary of the planning context in relation to the site area is provided in section 2.0 of this Environmental Statement Addendum. The existing policy relating to landscape indicated on Swansea UDP Proposals Map has been indicated on Figure 10.3. There has been no alterations to the landscape designations to the area since 2010.

Landscape Character

- 10.3.10 The AES 2010 described the existing character of the site area as *"a modern mixed use development laid out with high quality landscaped public open space areas and circulation areas"* and noted that the previous open character had changed to one *"dominated by built form"*.

Published Landscape Character Assessments

- 10.3.11 The majority of Wales is covered by LANDMAP assessments but the built up areas of Swansea and Cardiff are not included in the LANDMAP assessment. This is notably because the immediate context is more of a townscape character than landscape.
- 10.3.12 In 2009, Seascape Character Assessment was published by Countryside Council for Wales Landscape & Wildlife: this has now been included as part of the baseline assessment.

Townscape character

- 10.3.13 Essentially there are 4 types of townscapes within the study area, which are identified on Figure 10.3 –
- a) Fine grain, small scale urban form, primarily residential areas with low building heights - notably St Thomas residential to the north of Fabian Way and Swansea City hillsides to the west of the site
 - b) Irregular medium to large scale built form with meandering historic road network, primarily retail, commercial, civic buildings and historic core with vary building heights and predominant landmarks – Swansea City Centre
 - c) Dispersed large scale built form with wide spaces between industrial warehouses primarily located on low-lying areas – the docklands to the east of the site
 - d) Former now 'derelict' docks include man-made sea walls and exposed flat expanse of brownfield/scrub land with remains of historic industrial activities.
- 10.3.14 The site is currently 'between' townscape characters – partially medium scale built form where development has taken place interspersed with empty 'derelict' dockland sites.

Seascape character

10.3.15 Welsh Seascapes and their sensitivity to offshore developments classifies Swansea Bay as Regional Seascape Unit 46: Mumbles Head to Porthcawl Point (Swansea Bay) published in 2009. The key character areas described within this document are Swansea Seafront and beach (low-lying coastline), the estuary river mouth of Tawe and Neath and the Industrial working King and Queens Dock.

10.3.16 Areas of Landscape Value identified on Figure 10.3.

- Swansea Urban Woodland (Kilvey Hill) – The large natural feature is a vital visual representation of Swansea, visible from the city centre and can be used as a point of orientation for pedestrians. This provides informal recreation and includes a number of historic ancient lanes and footpaths. The Ramblers association have helped gain new rights of way during the 'Big Welsh Walk Festival' held on 04.05.13. The route of this walk was from the Marina across the sail bridge into the site and on to Kilvey Hill through St Thomas.
- Cultural landscape – the industrial docklands have historical use heritage including Kings dock cranes and the saw-tooth roof of the ABP warehouse. The docklands is identified by Landmap as a cultural landscape as the maritime history of Swansea Docks has had a major influence on the development of the city. The Prince of Wales Dock was opened in 1881 and used to export coal, tin and patent fuel. The site area was covered by a network of railway lines, connected to the various port related buildings and used to transport goods to and from the main rail lines.
- Tawe Riverside Walk – Allocated in the UDP 2008 as HC19, this emphasises the need to create a quality environment and to encourage the walking and cycle links/connections to promote physical activity and healthy living.
- SSSI Crymlyn Bog and Pant y Sais - These areas are valuable in terms of their ecology but also as National Nature Reserves they provide recreational trails through them - these are mainly formed of boardwalk routes to protect the lowland fen wetland habitat.
- Blackpill SSSI is an important habitat for local and migratory birds which offers the office at Blackpill Lido as a Wildlife Centre where visitors can view the migratory birds such as Sanderling, Ringed Plovers and Oystercatchers during the winter. The centre is managed by volunteers from the Gower Ornithological Society (GOS) and Royal Society for the Protection of Birds (RSPB) and opens on Sunday mornings (10.00am - 1.00pm) during winter months for residents and visitors to learn about and see first-hand the migrating winter birds that visit.

Visual baseline

Visual context and existing views

10.3.17 The various development plots within the overall site have different levels of visibility and the extent of this visibility will change as other plots are developed.

10.3.18 The original Design and Development Framework published in 2004 stated a need to retain the existing long-range views from the southern part of the site, across St Thomas to Kilvey Hill.

10.3.19 Views from the site to the north – these views are dominated by the green, partly wooded backdrop of Kilvey Hill (190m) with a telecommunications mast on its summit. The rows of houses at St Thomas lie on the lower slopes of this hill.

- 10.3.20 Views to the south – Views are generally of the water within the Prince of Wales dock and the flat undeveloped land that comprises the proposed Peninsula. From the entrance to the site, the high rise South Quay residential development on plot B5 (6-11 storeys) prevents views of the Peninsula area and the sea beyond. Views from Plot E9 are of the working port – the large D shed and the cranes that lie on the northern edge of Kings Dock.
- 10.3.21 Views to the west – views from the different plots that comprise the site are restricted by the existing developments. For example views from Plot A15/A16 are prevented by the Beacon Health Centre and the Ellipse office building and views from Plot C4 are prevented by the adjoining South Quay residential development.
- 10.3.22 Views to the east – When the Tidal Lagoon proposal is developed there would be views from the site towards this development and the landmark building that is proposed on its southern end. Development of the Peninsula would be likely to cut off the existing long distance views that residents of the Maritime Quarter have towards the east.

Tall buildings and local landmarks

- 10.3.23 There are some notable tall buildings within the development site and the study area; these are located on Figure 10.2 and identified on the viewpoints with their storey heights indicated where known. The Tall Buildings Strategy SPD for Swansea (October 2008) indicates two locations within the site as part of its strategy plan, one of which sits within the peninsula area.
- 10.3.24 The strategy notes that *“The aim of the Strategy is not to be site specific, nor to establish appropriate building heights, but to identify areas of opportunity. It focuses on the responsibility of the applicant to justify their tall building application, encouraging high quality design.”*
- 10.3.25 Local landmarks and listed buildings include the Grade II - Ice House factory (chimney), J-shed, Norwegian church and the newly built Sail Bridge. The tall, historic church steeple of Saint Thomas Church is a vital characteristic of the Saint Thomas skyline, visible from a variety of distant locations within the site.

Viewpoints 1 - 19

- 10.3.26 The site locality was visited in August 2014, February 2015 and March 2015 and all viewpoint locations within the 2010 AES have been revisited. It is noted that in some cases the view was represented more than once from the original Env Statement viewpoint locations and therefore some views have been discounted where they have not provided what is considered to be an important or representative view. These views are noted below:
- AES 2010 View 5: taken from the riverside on the west bank of the river Tawe adjacent to the Barrage.
 - This viewpoint has been discounted as it is repeated in view 5A, which provides better context and is considered a more important location to View 5.
 - AES 2010 View 8: taken from the car park close to Dylan Thomas Centre off East Burrows Road.
 - This viewpoint has been discounted as it does not provide a representational view nor was it included in the original WAES document.
 - AES 2010 View 13: taken from the residential area of Townhill.
 - This view is duplicated in 13A and is more obscured by vegetation in the foreground, therefore view 13A has been chosen as the more representative view of the two.
- 10.3.27 By defining the study area we have also identified new key or representative viewpoints from additional receptors which were previously not identified or applicable to the previous assessments. These new viewpoints are clearly identified below.

- 10.3.28 Views are included on Figure 10.6 and provide annotation of notable landmark buildings and their heights (if known) and the approximate extent of the site within the view. The viewpoint location and access plan is shown on Figure 10.5. Refer to Appendix 10 for all plans, viewpoints and figures.
- 10.3.29 **Viewpoint 1:** Taken from Fabian Way footpath approx. 1km to the east of the development. The main change to this view is that the vegetation to the foreground has grown. There are no additional buildings to the view from 2010.
Receptor: road users, commuters and visitors to Swansea. This view is looking west across the industrial land to the east of the site at an elevated point along Fabian Way. The view is short, transient and fleeting and is not considered to be representational of the approach into Swansea along Fabian Way. The view is considered of low importance and the site itself is not visible from here, other than the taller existing Altamar and South Quay residential buildings.
- 10.3.30 **Viewpoint 2** - Looking west along Fabian Way. There is no change to this view from 2010.
Receptor: road users, commuters and visitors to Swansea. This view is at the edge of the site to the north-east along Fabian Way. It is at road level taken from the opposite footpath to the site and the De Vere Village Hotel can be seen in the foreground. This view is a sequenced approach as you get closer to Swansea, with the site buildings prominent to the left and the retaining wall and vegetation limiting views to the right. It is considered to be more representational than view 1 of the approach to Swansea and therefore more relevant, with the site representing the majority of the view.
- 10.3.31 **Viewpoint 3** - From Jersey Park in the Dan-y-graig residential area. There is no change to this view from 2010.
Receptor: residents and visitors to the park for recreation. This view is looking south from Jersey Park within the residential area above Fabian Way. It is taken from the base of Kilvey Hill and is an elevated position which allows for wider views out to sea and Mumbles point can be seen to the right of the view in the distance. This is a relatively consistent view from the park, although the location is from one of the higher points and therefore views further south would be diminished. Being a well-used local amenity space this view is considered to be of importance and the site can be glimpsed through evergreen vegetation to the right of the view. Due to the location of residential buildings to the south, the east of the site is not visible from this location, however the dwellings would have clearer views across.
- 10.3.32 **Viewpoint 4** - From the pavement of Grenfell Park Road, looking across school playing fields. The main change to this view is that the trees to the foreground have been removed giving a clear and open elevated view across the playing fields. There are no additional buildings to the view from the 2010 view.
Receptor: residents and local road users. This view is looking south across the school fields. It is an elevated view with clear views out to sea and over to the Mumbles to the right of the view. The development at the Marina and the existing buildings to the SA1 area are clearly visible, with the industrial cranes and saw-tooth roof buildings visible to the left. This is a temporary view due to the location: further along the road the buildings in the foreground obscure the view towards the site. It is a relatively important view due to its prominence but would not be considered to be particularly valuable as it is within the context of the city boundaries. The site is clearly visible and makes up the majority of the view to the mid ground.

- 10.3.33 **Viewpoint 5A** - Taken from Trafalgar Footbridge looking towards the development site. This view is largely unchanged from 2010 with the addition of the Beacon Centre which is now visible between Altamar and South Quay residential buildings.
Receptor: Pedestrians via the footbridge – local residents and employees. This view is looking directly at the SA1 development site from the southern of the two pedestrian bridges that cross the Tawe River. It is looking north east at footpath level, with the Altamar and South Quay residential buildings to the foreground with Kilvey Hill as a backdrop. To the right hand side of the view the new townhouses along the eastern edge of the Prince of Wales Dock can be seen with the industrial sheds far right. This view represents an arrival point and fairly continuous view from this location and is considered to be important due to the gateway location of the bridge. However it is used less than the sail bridge and is considered of medium value. The site occupies the majority of and is the focus of the view.
- 10.3.34 **Viewpoint 6** - Taken from Arethusa Quay at the western end of the Marina. There is no change to this view from 2010.
Receptor: pedestrians and road users – local residents and visitors. This view is looking across the marina to the site in the east. The view is mainly obscured by buildings and the marina in the foreground so the site is not really perceivable from this location.
- 10.3.35 **Viewpoint 7** - Taken from footbridge over New Cut Road approx. 300m north of the railway station. This view has changed since 2010 with the addition of new buildings along the western Tawe River bank.
Receptor: pedestrians crossing the bridge. This view is looking south east towards the site and is elevated over the A483 road. It is a relatively limited view as development and vegetation either side of the bridge obscure the site from view either side of the bridge. It is not considered to be an important view and the site is obscured from view by new development and buildings along the riverbank.
- 10.3.36 **Viewpoint 8A** - Taken from the Sail Bridge looking towards the development site. There is no change to this view from 2010.
Receptor: pedestrians via the footbridge – local residents and employees, visitors to local business on site. This view is an open, slightly elevated view of the site from the Sail Bridge. The foreground includes the constructed and historic buildings on site of A2, A3, the Ice Factory and J Shed, with the Altamar developments visible to the right of the bridge. It is a continuous view of relative importance as this is one of the main pedestrian entry points to the SA1 area. The site sits to the centre of the view with Kilvey Hill in the background and the river bank and marina clearly visible on either side.
- 10.3.37 **Viewpoint 9** - Taken from Fabian Way at street level, close to the junction with East Bank Way. There is no change to this view from 2010.
Receptor: footpath and cycleway users, road users. This view is looking east along Fabian Way from the Kings Road junction. It is at road level and quite a short view due to the proximity of SA1 development buildings to the road edge. This is a sequential view and is not considered to be of particularly high importance. The site entrance is to the right of Technium building with the site forming the main part of the view.
- 10.3.38 **Viewpoint 10** - Taken from the northern road bridge across the River Tawe. There is no change to this view from 2010.
Receptor: pedestrians and road users – local residents and commuters. This view is looking south from the second road bridge across the Tawe. It is slightly elevated with clear sight of the western edge of the SA1 developments and the sail bridge and Marina tower on the opposite river bank. This is a temporary view for the duration of the bridge and is of low amenity value where the site forms part of the overall composition of urban form.
- 10.3.39 **Viewpoint 11** - Taken from Ivey Place. There is no change to this view from 2010.
Receptor: pedestrians - shopping and commuters. This is an elevated view from the car park link adjacent to the High Street. The majority of the view is looking at the back of house service area of the Parc Tawe shopping centre with the tallest of the site buildings visible in the background. This view is fleeting and of low value.

- 10.3.40 **Viewpoint 12** - Taken from public open space just below Berwick Terrace on Mount Pleasant. There is no change to this view from 2010.
Receptor: recreational use of Public Open Space and local residents with elevated views. This view is looking south east from Mount Pleasant and is a wide and elevated view over the city and out to sea beyond. It provides a fairly consistent view from this location due to the distance away from the site, which can just be seen in the background by picking out the recognisable landmark buildings. It is an important view of medium to high value representing the neighbourhood.
- 10.3.41 **Viewpoint 13A** - Taken from Pant-y-Celyn Road in the residential area of Townhill. There is no change to this view from 2010.
Receptor: recreational use of Public Open Space and local residents with elevated views. This view is looking east from the residential edge at Townhill. It is elevated and wide-ranging although the vegetation in the foreground screens the view partially to either side of the site location. This is a fleeting view along this footpath and it is considered to be of medium value because it is taken from a public open space. The site is barely visible from this location due to the distance and urban mass of Swansea to the mid ground.
- 10.3.42 **Viewpoint 14** - Taken from close to the junction on Manor Road and Hopkin Street in Brythfryd. There is no change to this view from 2010.
Receptor: Local residents with elevated views. This view is lower on the hill than viewpoint 12 so the view is limited to the urban development of Swansea which diminishes as you go down the hill. The view is temporary and not of particular importance or value, while the site is perceived as part of the composition of Swansea City in the background.
- 10.3.43 **Viewpoint 15** - Taken from Swansea bay cycle path close to the junction of Mumbles Road and Newton Road. There is no change to this view from 2010.
Receptor: pedestrians and visitors on the Wales Coast Path National Trail. This view is across Swansea Bay towards the site from the Mumbles. It is clear that the site sits to the foreground of Kilvey Hill at a considerable distance to the view. It is a permanent view of high value although the site is insignificant and unremarkable in the overall composition.
- 10.3.44 **Viewpoint 16** - Taken from the north side of Fabian Way and shows the junction with Langdon Road. This view is largely unchanged from 2010 with the Beacon Centre to the south of VOSA being the only additional building.
Receptor: road users, commuters and visitors to Swansea. This view is looking directly at the northern edge of the site from Fabian Way footpath and forms part of the transient and sequential view along the road. It is not of particular importance with the site making up the majority of the view, with the obvious gap to the centre where plot A15 will be developed as a future phase to the masterplan area.
- 10.3.45 **Viewpoint 17** - Taken from the footway which leads to West Pier. There is no change to this view from 2010.
Receptor: recreational users of the beach via Welsh coast path national trail, local fishermen and residents at marina. This view is from the water's edge looking north directly at the development site. It is relatively important as it is representative of the end of the beach and the site can be clearly seen. The existing development buildings are viewed with Kilvey Hill as a backdrop which prevents the buildings from breaking the skyline. Swansea point stands tall to the left and the low industrial units and taller dockside cranes can be seen to the right side of the view.
- 10.3.46 **Viewpoint 18** - (New Viewpoint) Taken from footpaths on Kilvey Hill. This is an additional viewpoint which was not included in the 2010 assessment.
Receptor: walkers and visitors to the recreational rights of way on Kilvey Hill, plus local businesses and residents. This is the most elevated view of the site available which captures a wide angle to include the bay and Swansea City to the right and the industrial docks to the left with the site sitting low in the centre view. This is a newly designated Right of Way and there is evidence that it is well used by walkers, mountain bikers and horse riders. The view is considered to be important and valued with the site making up a small part of the overall composition.

- 10.3.47 **Viewpoint 19 – (New Viewpoint)** Taken from the Beach at Black Pill along Swansea Bay. This is an additional viewpoint which was not included in the 2010 assessment.~
Receptor: recreational visitors to the beach. This view is a representational view from the Black Pill area mid-way along the bay from the Beach which is accessed from the Wales Coast Path National Trail. It is a fairly consistent view due to the distance of the site and is a highly valued local amenity. The site is barely visible and forms part of the wider context of the City.

10.4. Assessment of Revised Scheme – Landscape Effects

Previous 2002 WAES Assessment

- 10.4.1 In the original 2002 WAES, the Landscape Impacts are assessed as follows:

“In general terms the site contributes little to the overall landscape setting of the City and the site provides no material benefit to the landscape and visual amenity of this area. The newly developed marina and the modern Technium building make a more positive contribution to the landscape amenity and even the distinct character of the operational docks has greater landscape value than the application site.

Short term impacts

The greater impacts will be on those occupying the earlier, completed phases of the development, who will have adjacent construction activity. This will have to be carefully managed throughout the construction lifespan.

Long term impacts

The proposed development will include new buildings and landscape measures that will make a significant long-term improvement to the landscape amenity to this area. Proposed landscaping measures will enable the development to be seen as an extension to Swansea City waterfront image, complementing the recently developed Maritime Quarter.... The impact and its significance of the proposed development on areas surrounding the site will, to some extent, depend on the successful integration of the scheme with the surrounding development.

The development will also positively increase the perception received by visitors to the City as they approach the Gateway of the City along Fabian way. In addition those arriving or leaving by the Swansea to Cork Ferry will have an improved perception of the city waterfront within the bay.”

The potential impact of the revised SA1 development has been assessed with reference to the 2014 baseline described and the revised masterplan proposals. The methodology from previous assessments is set out in Figure 10.4 and will be adhered to in order to provide a comparable assessment. Additional methodology as outlined in section 10.2 will also be considered in order to bring the assessment in line with the new GLVIA guidance.

Assessment of Effects: Landscape Character

- 10.4.2 It was noted that in 2010 AES the development implemented on the site has already led to a change in character “from that of an open, industrial area with a semi derelict appearance, to a modern mixed use development laid out with high quality landscaped public open spaces and circulation areas. Plots awaiting development have a derelict appearance with no significant vegetation cover.”

- 10.4.3 Development within these (currently empty) zones will be seen as a natural extension of the existing built form in the north west of the site which has created a gateway to Swansea and will complete the development around the Prince of Wales Dock, enhancing its setting.
- 10.4.4 The 2014 baseline study has established that the development of some of these plots have progressed further, and the overall character of the site is transforming to one of more built form.
- 10.4.5 It is considered that the new proposals will give a moderately beneficial impact to the existing landscape character.

Assessment of Effects: Townscape Character

- 10.4.6 In the 2010 assessment it was noted that “the context of the development is that of a wider area of regeneration, which effectively forms an extension to Swansea city centre.....The further development of SA1 will be complemented by the provision of further landscaped public open spaces around the waterfront and dock as indicated on the master plan.
- 10.4.7 On balance it is considered that the further development proposed for the SA1 site will give rise to a slight beneficial impact to existing landscape character.”
- 10.4.8 The new development proposed in zones A, B, C, E and F will reflect the townscape character that the SA1 development has already established.
- 10.4.9 It is considered that the massing of the new masterplan proposals will provide a continued improvement to the townscape character of the area as the empty plots are developed and add to the existing built form. The development will provide quality public open space around the waterfront and docks as indicated on the masterplan.
- 10.4.10 It is considered that the new proposals will result in a moderately beneficial impact to the existing townscape character.

Assessment of Effects: Seascape Character

- 10.4.11 The key seascape character areas described within this document are Swansea Seafront and beach (low-lying coastline), the estuary river mouth of Tawe and Neath and the industrial working landscape at the King and Queens’ Docks.
- 10.4.12 The proposed development will not affect the Seafront or beach areas. There will be a possible increase to the ground floor active uses adjacent to the River Tawe compared to the 2010 scheme, however by providing additional areas of riverside development the proposals will reinforce the existing character of development along the river estuary. The development itself will therefore have a moderately beneficial effect on the Seascape and its immediate character surrounding the site.

Assessment of Effects: Areas of Landscape Value

- Swansea Urban Woodland (Kilvey Hill) – The site proposals will not have a direct effect on the Urban Woodland area from a landscape point of view and it is not considered to alter the value of this distinct local feature.
- Cultural landscape – The industrial and maritime history of Swansea Docks has had a major influence on the development of the city. Although the site proposals have altered the dockland area around the Prince of Wales Dock in particular to an urban character, the original dock use is still present as a perceivable influence on the area. The site development will help clarify and strengthen the boundary between city and working dock as it currently occupies some large empty development plots awaiting regeneration.

- Tawe Riverside Walk – The proposed development along the Tawe river bank will further reinforce the connection of the city to the waterfront. This will effectively extend the riverside walk and cycle links down to the peninsula and will therefore have a positive effect on the Riverside and its use as an amenity to the city.
- SSSI Crymlyn Bog, Pant y Sais and Blackpill – The site proposals will not have a direct effect on the SSSI's in the area and it is not considered to alter the value of these valuable eco-systems. By increasing the site's biodiversity opportunities through the new proposals the proposed development can be considered to positively support the wider ecology systems within the area.

Assessment of revised scheme - Visual Effects

10.4.13 Previous assessments – 2002 WAES, 2010 AES

The original 2002 WAES notes that *“due to the landform and surrounding land uses the site is only overlooked from elevated vantage points, with significant views from points lying adjacent to the site boundaries.”*

Visual Impact

10.4.14 The assessment of the visual impact of a development is derived by considering a number of different factors. These include the following three elements:

- 1) The existing baseline situation – i.e. what are the current views of the site and the surrounding context? In this case the existing views of the site are of derelict sites that are a detracting element to the wider waterfront development.
- 2) The magnitude of change to the existing baseline situation – any change is likely to be assessed as of a low magnitude because it is further built development within a built environment.
- 3) The sensitivity of the visual receptor – this is derived by considering the susceptibility of the receptor to change and the value of the view. The majority of receptors will be viewing the site from roads, offices and other dockside housing developments, well used to visual change at the site location and thus have a low susceptibility to change. The majority of views will be from other urban settings and not from designated landscapes and thus have a low value in assessment terms.

Visual Receptors

10.4.15 By identifying the ZTV and from this the visual envelope of the site, the viewpoint locations have been re-evaluated and assessed using the methods set out within Figure 10.3. The visual receptors have been identified and clarified where the 2010 assessment did not clearly define them.

Comparison of assessments

10.4.16 The findings of the previous assessment of 2010 and the findings of the current assessment have been added in table form below:

Representative Viewpoint	Visual Assessment Summary – 2010 AES		
	Sensitivity of the View	Magnitude of Change/Impact	Potential Level of Effect
Viewpoint 1: Taken from Fabian Way footpath approx. 1km to the east of the development	<i>Low</i>	-	Neutral
Viewpoint 2: Looking west along Fabian Way	<i>Low to Medium</i>	Low to Medium	Slight to Moderate Adverse
Viewpoint 3: From Jersey Park in the Dan-y-graig residential area	<i>Medium</i>	Low	Slight to Moderate Adverse
Viewpoint 4: From the pavement of Grenfell Park Road, looking across school playing fields	<i>Low</i>	Low	Slight Adverse
Viewpoint 5+5A: Taken from Trafalgar Footbridge looking towards the development site	<i>High</i>	Medium	Slight to Moderate Adverse
Viewpoint 6: Taken from Arethusa Quay at the western end of the Marina	<i>Low</i>	-	Negligible to Slight Adverse
Viewpoint 7: Taken from footbridge over New Cut Road approx. 300m north of the railway station	<i>Medium</i>	Low	Slight to Moderate Adverse
Viewpoint 8+8A: Taken from the Sail Bridge looking towards the development site	<i>High</i>	Low	Negligible to Slight Adverse
Viewpoint 9: Taken from Fabian Way at street level, close to the junction with East Bank Way	<i>Low</i>	Low to Medium	Slight to Moderate Adverse
Viewpoint 10: Taken from the northern road bridge across the River Tawe	<i>Medium</i>	Low	Slight Adverse
Viewpoint 11: Taken from Ivey Place	<i>Low</i>	Low	Slight Adverse
Viewpoint 12: Taken from public open space just below Berwick Terrace on Mount Pleasant	<i>High</i>	Very Low	Negligible Adverse
Viewpoint 13 & 13A: Taken from Pant-y-Celyn Road in the residential area of Townhill.	<i>High</i>	Very Low	Negligible Adverse
Viewpoint 14: Taken from close to the junction on Manor Road and Hopkin Street in Brythfryd	<i>Medium</i>	<i>No change</i>	Slight Adverse
Viewpoint 15: Taken from Swansea bay cycle path close to the junction of Mumbles Road and Newton Road	<i>High</i>	<i>No change</i>	No change
Viewpoint 16: Taken from the north side of Fabian Way and shows the junction with Langdon Road	<i>Low</i>	-	Slight to Moderate Adverse
Viewpoint 17: Taken from the footway which leads to West Pier	<i>High</i>	Medium	Slight to Moderate Adverse

Table 10.1: Visual Assessment Summary – 2010 AES

- 10.4.17 For clarity we have shown the viewpoints with potential adverse effects in orange and potential beneficial effects in green.
- 10.4.18 It is noted that the 2010 assessment did not identify any beneficial impacts from the development proposals. Also the Receptor Sensitivity for each view was not identified during their assessment, so these are listed as the current assessment categories and indicated in italics.
- 10.4.19 In some cases the Magnitude of Change was described as 'No change', which is not listed in the methodology categories and has therefore been added in italics where this is applicable. In some cases the Magnitude of Change was not identified so these have been left blank.

Representative Viewpoint	Visual Assessment Summary – 2015 Proposals		
	Sensitivity of the View	Magnitude of Change/Impact	Potential Level of Effect
Viewpoint 1: Taken from Fabian Way footpath approx. 1km to the east of the development	Low	Very Low	Neutral
Viewpoint 2: Looking west along Fabian Way	Low to Medium	No Change	Neutral
Viewpoint 3: From Jersey Park in the Dan-y-graig residential area	Medium	Low	Negligible
Viewpoint 4: From the pavement of Grenfell Park Road, looking across school playing fields	Medium	Medium	Slight Beneficial
Viewpoint 5A: Taken from Trafalgar Footbridge looking towards the development site	High	High	Moderate Beneficial
Viewpoint 6: Taken from Arethusa Quay at the western end of the Marina	Low	Very Low	Neutral
Viewpoint 7: Taken from footbridge over New Cut Road approx. 300m north of the railway station	Medium	Low	Negligible
Viewpoint 8A: Taken from the Sail Bridge looking towards the development site	Medium	Medium to High	Moderate Beneficial
Viewpoint 9: Taken from Fabian Way at street level, close to the junction with East Bank Way	Low	Medium	Negligible
Viewpoint 10: Taken from the northern road bridge across the River Tawe	Low	Low to Medium	Negligible
Viewpoint 11: Taken from Ivey Place	Low	Low	Neutral
Viewpoint 12: Taken from public open space just below Berwick Terrace on Mount Pleasant	High	Very Low	Negligible
Viewpoint 13 & 13A: Taken from Pant-y-Celyn Road in the residential area of Townhill.	High	Very Low	Negligible
Viewpoint 14: Taken from close to the junction on Manor Road and Hopkin Street in Brythfryd	Medium	No change	Neutral
Viewpoint 15: Taken from Swansea bay cycle path close to the junction of Mumbles Road and Newton Road	High	Low	Negligible
Viewpoint 16: Taken from the north side of Fabian Way and shows the junction with Langdon Road	Low	Very High	Moderate Beneficial
Viewpoint 17: Taken from the footway which leads to West Pier	High	High	Moderate Adverse
Viewpoint 18: (New Viewpoint) Taken from footpaths on Kilvey Hill	High	Medium	Moderate Beneficial
Viewpoint 19: (New Viewpoint) Taken from the Beach at Black Pill along Swansea Bay	High	Very Low	Negligible

Table 10.2: Visual Assessment Summary – 2015 Proposals

- 10.4.20 The tables clearly identify that the new 2015 proposals are seen to have a positive and therefore beneficial impact on some of the views, usually where the context of the site is of urban form and further development of the site will contribute to and enhance the existing composition of the view.

Residual impacts

- 10.4.21 As the operational phase of the site is expected to be permanent albeit with continuing minor changes as developments are updated or replaced, the residual impacts of the scheme are not considered to be of importance as these would not differ from those in the Operational Phase.

Assessment of key viewpoints

- 10.4.22 The 2015 assessment identifies 6 key and notable viewpoints, which have slight or moderate impact significance. These are described in further detail below. As this chapter is an update to the assessment of visual impacts, it is therefore concluded that where the viewpoints have been assessed to be of Negligible or Neutral impact significance then there is no need to describe these further.

- 10.4.23 In each instance the views are described and assessed with regards to:

- Construction effects
- Operation (Built phase) effects

- 10.4.24 **Viewpoint 4** – Taken from the pavement of Grenfell Park Road, looking across school playing fields.
Receptor: residents and local road users

Construction Effects:

- 10.4.25 This is a medium range view and the site sits to the centre from this location. Construction phase effects will be clearly visible as construction cranes will appear within the view, forming an extension to the existing urban fabric with reference to the industrial cranes which will remain visible to the left of the view.

Operation (Built Phase) effects:

- 10.4.26 The long-term development of the completed SA1 development will be 'filling in the gaps' of empty development plots that are currently visible, which will result in a more defined edge to the urban form, viewed as part of the city development.
- 10.4.27 The sensitivity of the view is assessed as medium and the magnitude of change or impact as medium, with the potential level of effect as slightly beneficial to the view by improving the urban boundary and context.
- 10.4.28 **Viewpoint 5A** - Taken from Trafalgar Footbridge looking towards the development site.
Receptor: pedestrians via the footbridge – local residents and employees.

Construction Effects:

- 10.4.29 The 2015 peninsula development will be evident particularly to the right hand side of Trafalgar Bridge. This is a designated public right of way and forms part of the Wales Coast Path national trail, connecting the peninsula to Swansea beach and beyond as indicated on Figure 10.5. The university owned plots will be developed first, which will comprise the core buildings within the peninsula.
- 10.4.30 The proposals will break the skyline due to the proximity of the development and the angle of the view as Kilvey Hill steps down in this location. Construction cranes will be taller than the heights of the buildings developed – typically between 2- 6 storeys in this location. The urban form will be brought to the foreground.

- 10.4.31 Despite this, the completion of development to the peninsula will continue the urban form context established on site and will be an attractive view in terms of townscape because the current view of the site is of empty development plots. The new proposals will provide a visual marker to the other end of the bridge and frame the view across to the peninsula development.
- 10.4.32 The development of the two 12 storey buildings to the peninsula point would come at a later phase and would be in the peripheral view from this location.

Operation (Built Phase) effects:

It is considered that once all the proposed developments have been completed, the overall effect would be improved legibility and urban context of the current view of open and empty plots.

- 10.4.33 The sensitivity of the view is assessed as high and the magnitude of change or impact as high, with the potential level of effect as moderately beneficial to the view.
- 10.4.34 **Viewpoint 8A** - Taken from the Sail Bridge looking towards the development site
Receptor: pedestrians via the footbridge – local residents and employees, visitors to the J-shed and Ice House factory.

Construction Effects:

The 2015 peninsula development will be evident to the right hand side of block B7. The first phase of the development to the peninsula will include the central blocks of the university buildings which are designed to reach a maximum height of 5 storeys, with the associated car park plot designed up to 6 storeys. This will sit between the Altamar developments in this view. Once completed, the two proposed 12 storey buildings to the peninsula point will break the skyline between Trafalgar Bridge and Swansea Point. The latter is 14 storeys and the proposals will therefore be lower this.

Operation (Built Phase) effects:

The completion of development to the peninsula will continue the urban form context established on site and will be an attractive view in terms of townscape because the current view of the peninsula is of empty development plots. The view to the industrial cranes and sheds in the background will be screened by the new development.

- 10.4.35 The sensitivity of the view is assessed as medium and the magnitude of change or impact as medium to high, with the potential level of effect as moderately beneficial to the view.
- 10.4.36 **Viewpoint 16** - Taken from the north side of Fabian Way and shows the junction with Langdon Road
Receptor: road users, commuters and visitors to Swansea

Construction Effects:

During construction of block A15 there will be increased activity along the road and taller equipment will be visible.

- 10.4.37 Operation (Built Phase) effects: once all phases are complete there will be a continuation of development between blocks D1A and A12 which will provide a better context for the approach to the city along Fabian Way. This will improve street legibility and encourage active frontage to the site.
- 10.4.38 The sensitivity of the view is assessed as low and the magnitude of change or impact as very high, with the potential level of effect as moderately beneficial to the view.

10.4.39 **Viewpoint 17** - Taken from the footway which leads to West Pier
Receptor: recreational users of the beach via Welsh coast path national trail, local fishermen and residents at marina

10.4.40 Construction Effects: The first phase development will create the new peninsula University core buildings - these will appear within the context of the existing site development although they will be to the mid ground of the view. The construction will require some high level cranes, however these will reflect the forms of existing cranes along the King's Dock which are a permanent feature to the view. This view will clearly show the boundary between the industrial dock and associated structures and buildings, and the urban extension of Swansea along the River Tawe waterfront. This boundary will be strengthened by the new development of the site area.

Operation (Built Phase) effects:

Once complete, the new peninsula buildings will sit to the centre of the view, with the 12 storey buildings being most prominent to the centre-right of the view. Their location and proposed height will obscure Kilvey Hill and may break the skyline to the right of the hill crest, making Kilvey Hill less dominant and more of a backdrop to the development and setting.

10.4.41 This view is probably the most important in landscape terms as it is located within the context of Swansea beach and is looking towards Kilvey Hill, which is another locally important landscape feature. The addition of the site development will diminish the visual connection between the two. Although the new development will break the skyline from this location, the existing 14 storey Swansea Point gives some reference to heights and the distance to the eastern bank and the perspective view will reduce the proposed 12 storey peninsula buildings within the view overall.

10.4.42 The sensitivity of the view is assessed as high and the magnitude of change or impact as high, with the potential level of effect as moderately adverse to the view.

10.4.43 **Viewpoint 18** - (New Viewpoint) Taken from footpaths on Kilvey Hill
Receptor: walkers and visitors to the recreational rights of way on Kilvey Hill, plus local businesses and residents

Construction Effects:

During the construction phase there will be increased activity and equipment evident within the development plots, in particular to the peninsula area. These will be seen within the wider context of the working dock and the urban setting of Swansea to the right of the view.

Operation (Built Phase) effects:

The completion of the SA1 development will extend the urban form to the east around the Prince of Wales Dock. This will complete the current areas between those constructed to date and will therefore provide better connectivity of the townscape and built areas within the view. New landmark buildings will be included on the peninsula and will articulate the waterfront as is the case with Swansea Point and Meridian Tower.

10.4.44 The sensitivity of the view is assessed as high and the magnitude of change or impact as medium, with the potential level of effect as moderately beneficial to the view.

10.5. Cumulative effects

GLVIA Definition

- 10.5.1 *The GLVIA defines cumulative effects as the ‘Result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated or separate to it)...’*
- 10.5.2 *The GLVIA also notes that ‘Cumulative effects can also arise from the intervisibility of a range of developments and/or from the combined effects of individual components of the proposed development occurring in different locations or over a period of time. The separate effects of such individual components or developments may not be significant, but together they may create an unacceptable degree of adverse effects on visual receptors within their combined visual envelopes.’*
- 10.5.3 The landscape and visual cumulative effects that may arise as a result of the proposed development in conjunction with other developments within the 5km radius study area have been assessed as per the methodology above with a focus on cumulative visual effects.

Notable development areas

- 10.5.4 There are 3 notable development areas other than the SA1 Masterplan area currently and these are as follows:

1) Tidal Lagoon Swansea Bay

The Swansea Bay Tidal Lagoon is a proposal for a man-made seawall impounding an area of 11.5 sq km of sea water. Power would be generated by creating a “head” of water – a difference in water level between the inside and outside of the lagoon – and channelling the resulting flow through low-head hydro turbines. The development would comprise a seawall, concrete turbine housing and hydro turbines.

Development consent for the proposals was granted on the 9th June 2015.

In terms of visual impact the tidal lagoon will only affect views that are seaward of the site, including views to the north of the SA1 area. As the lagoon will be low-lying in its nature the visual effect will be low as it will not break the skyline against the backdrop of the sea. It is therefore considered that the cumulative visual effect would be negligible or no change.

2) Swansea City Centre: Strategic Framework Review

A consultation draft was issued in January 2015. This includes extensive regeneration plans for the city centre. Although this is city centre focused the study area includes the Sail Bridge and the west half of the SA1 development area and Ice House Square is identified as a positive space within the strategic site plan. The themes and objectives identified within the document are Sustainability, Design, Accessibility and Movement and Distinctiveness.

The aspirations of this document will have a positive beneficial effect alongside the SA1 development proposals as both schemes aim to increase the quality of the public realm and inter-connectivity between the city centre and Swansea Waterfront.

3) Fabian Way Wind turbine – application by Swansea Bay Water Treatment Works

An appeal decision was made to grant planning permission in October 2014, subject to conditions for a 73m tall and 58m diameter single wind turbine. This will be located to the east end of Kings Dock.

The Landscape and Visual Assessment supporting the application assessed the effects as follows:

10.5.5 "...cumulative effects would be negligible in westerly views and more likely in easterly views from the Gower Peninsula, along the Swansea Bay Waterfront and within the urban areas of Swansea. Views towards the north are limited due to the built up area of Swansea as well as intervening landform and vegetation."

10.5.6 The cumulative effect of the Wind Turbine combined with the SA1 development on the local receptors would therefore not be considered to be significant.

10.6. Landscape and Visual Mitigation and Enhancement Measures

2002 WAES Assessment

10.6.1 The original Mitigation measures of the 2002 ES recommended "...a high quality design using materials of local characteristics and strategic placing of buildings of public spaces the development should be perceived as an extension to the city centre of Swansea...integration of the site will be encouraged and will attract economic investment and public interaction."

2010 AES Assessment

10.6.2 It was also noted in the 2010 assessment that the Mitigation Measures should include

- materials to adhere to Design Development Framework principles
- compliance with open space strategies to continue and ensure cohesion of approach
- consideration of elevational treatments

Construction Phase

10.6.3 Further to this, we would expect the development to follow these additional methods for mitigation of landscape and visual effects during construction phase:

- The proposals are expected to have several construction phases, with development taking place over a 10 year period which will reduce intensity of construction at any one time.
- Provide temporary hoarding and screening to individual developments
- Where a plot is known not to form part of first phase or early development, the use of temporary landscapes could be considered to provide use of what would otherwise be derelict sites. This may not be appropriate in all cases and should be considered on a plot by plot basis.

10.6.4 Additional measures designed for Operation (Built) Phase:

- Placing of buildings to frame views
- High quality design to contribute positively to the City, with use of local materials where possible
- Sensitive to adjoining communities – 'designing-in' for wider neighbourhoods
- Enhanced access to SA1 – gateway features and improved connectivity
- To encourage native planting where appropriate to increase bio diversity – illustrated on Figure 10.7
- Strengthen the existing character (of predominantly built form)
- Include street trees to aid microclimate and to visually enhance the site.

- 10.6.5 It is noted that the assessment of revised scheme's visual effects identifies viewpoint 17 to have a moderately adverse effect, whereas all other viewpoints are considered and assessed to have a neutral or beneficial effect. This is mainly because of the loss of visual connection between the two landscape features – Swansea beach and Kilvey Hill.
- 10.6.6 In order to mitigate this effect long term, the masterplan proposals look at providing a Green Infrastructure strategy which addresses landscape and ecology features within the wider context of the local area, ensuring that there is connectivity and biodiversity is encouraged by providing opportunities across the site. Part of this strategy includes creating a 'green link' to the future tidal lagoon development, indicating opportunities for green and brown roofs and providing biodiversity enhancements to the area. All these measures will reduce the adverse effects on this viewpoint in the long term and will enhance and improve natural connections within the site area to the wider context and surroundings.

Lighting

- 10.6.7 While the 2010 update did not mention the effect of lighting, the 2002 report has noted:
- 10.6.8 *"As the site is located within an urban location and the new lighting will be seen in context of existing lighting associated with Fabian Way and the city centre, the impacts of the street lighting are not considered to be of major significance on the surrounding areas. Specification of lanterns etc. will be to adoptable standards"*
- 10.6.9 It is considered that this original assessment would still apply.

10.7. Summary

2002 WAES summary

- 10.7.1 The site currently is of low landscape and visual quality and makes little contribution to the surrounding areas that have been considerably improved. The development proposals will significantly alter the current landscape quality, extending the city development and mixed use development across the river. With the additional proposal of access points across the river Tawe (now constructed) this will increase the cohesion between the areas, bringing long term landscape benefit for both encouraging interaction with Swansea City Centre and other waterfront developments.
- 10.7.2 The development will be visible from elevated points and areas adjacent to the site boundary. Due to the existing visual amenity of current views, which comprise of industrial working docks and equipment the proposals will considerably improve the quality of the existing views.
- 10.7.3 With consideration of local styles and building materials, landscape infrastructure and detailing of the site will make a very positive contribution to the Swansea waterside and surrounding area."

2010 AES Summary

- 10.7.4 In the 2010 update the report assessed the impact on landscape character to be 'slight beneficial'. Visual impacts were assessed as "ranging from negligible to slight to moderate adverse to views from public viewpoints and to views for residents based on the additional extent of built form that will be seen. Overall, however, the development of the SA1 site forms part of the regeneration of the area and can be viewed as beneficial being in accordance with established planning policy in this regard."

Overall likely visual impact (2015 SA1 Waterfront Innovation Quarter)

- 10.7.5 On review of the previous assessments and review of the existing and new viewpoints shown in this report indicates that where the AES 2010 assessed views to have an adverse effect, our assessment has expected to see an overall beneficial effect. This is largely due to the continuation of the townscape context which has already established to the masterplan area; development of the plots within the sites is therefore likely to result in a positive visual effect.
- 10.7.6 We have identified viewpoint 17 to have the only adverse visual effect, due to the reduction in visual connectivity to Kilvey Hill from Swansea beach area.

Conclusions

- 10.7.7 The proposed development is predicted to have an overall positive effect on both the landscape character and visual amenity of the area, and by comparison to the 2010 addendum masterplan, the new 2015 proposals are considered to be a beneficial improvement to the masterplan area as a whole. The previous proposed 'leisure quarter' included some large and bulky massing of buildings, while the peninsula development proposed by the University team has been refined to sit more favourably in terms of scale and permeability, allowing it to 'knit' into the urban fabric of Swansea City.

Figures

Refer to Appendix 10 for figures, plans and viewpoints.

- 10.7.8 Figure 10.1: Building heights – 2010 AES and 2015 Revised SA1 Masterplan.
- 10.7.9 Figure 10.2: Landscape Designations, Character and Areas of Landscape Value
- 10.7.10 Figure 10.3: Visual Envelope
- 10.7.11 Figure 10.4: Landscape and Visual Assessment Methodology
- 10.7.12 Figure 10.5: Viewpoint Location and Access Plan
- 10.7.13 Figure 10.6: Viewpoints 1-19
- 10.7.14 Figure 10.7: Landscape Mitigation: Green Infrastructure Strategy Plan

11. Archaeology and Cultural Heritage

11.1. Introduction

- 11.1.1 The purpose of this chapter is to assess the potential for the development to give rise to effects on the archaeological resource, as well as to devise suitable mitigation methods to reduce any adverse effect and enhance any beneficial effect. The assessment reviewed current information regarding the archaeological resource of the study area, and is based on existing knowledge. An initial desk-based assessment was conducted in 2002 (2002 WAES), with an addendum in 2010 (2010 AES), and with the 2015 revisions to the masterplan the current chapter updates and builds upon these preceding documents.

11.2. Policy and Legislative Policy

- 11.2.1 Detailed advice on archaeology in the planning process is contained in *Welsh Office Circular 60/96 Planning and the Historic Environment: Archaeology*. Works affecting an ancient monument and its setting are protected through implementation of the *Ancient Monument and Archaeological Areas Act 1979*. Detailed advice on Environmental Impact Assessment is contained within *Welsh Office Circular 11/99 Environmental Impact Assessment*, which forms part of the wider *Archaeology Planning Policy Wales (PPW)*. This document sets out the land use planning policies of the Welsh Assembly Government. *Planning Policy Wales* is supplemented by a series of TANs, and together with the Welsh Office Circulars comprise the *National Planning Policy*.
- 11.2.2 The *Ancient Monument and Archaeological Areas Act 1979* sets out a presumption in favour of preservation *in-situ* concerning sites and monuments of national importance (scheduled), and there exists in the current *Planning Policy Wales (Chapter 6)* a presumption in favour of preservation *in-situ* of all types of archaeological sites and monuments.
- 11.2.3 The *Swansea Unitary Development Plan 2008 (UDP)* sets out the council's policies on the historic environment (section 1.4) with the most pertinent of those to the current development area being policies EV6-EV12. Policy EC2 refers to the specific development of the SA1 Swansea Waterfront.

11.3. Methodology and assessment criteria

- 11.3.1 The current assessment comprises a review of existing information about the archaeological resource of the same study area utilised for the 2002 assessment (2002 WAES) and the 2010 addendum (2010 AES), defined by the National Grid coordinates SS 65709200, SS 65709375, SS 68009200 and SS68009375.
- 11.3.2 The assessment is intended to conform to the Chartered Institute for Archaeologist's *Standards in British Archaeology: Archaeological desk-based assessments* (1994, amended 1999, 2001, 2008, 2012 and 2014).

- 11.3.3 Information recorded on the regional Historic Environment Record (HER) and National Monuments Record (NMR) was assessed. Cartographic data was studied, along with relevant published information. Current Listed Building data and information on Scheduled Ancient Monuments and Registered Landscapes was obtained from Cadw. Additionally, LANDMAP and Historic Landscape surveys were considered in detail where appropriate. Due to the 'urban location, industrial history and comparatively recent establishment of the proposed redevelopment site' the 2002 assessment (2002 WAES) did not examine any aerial photographs. Similarly, no aerial photographs (AP) were viewed during the course of the current assessment with the exception of RAF (1945) Aps held by the Trust.
- 11.3.4 The gazetteer (Appendix 11.1) will only list those sites within the development area, newly identified sites and existing sites where the record has been enhanced during the assessment. A site visit was made on the 22nd of July 2015.

11.4. Direct effects (Monuments)

- 11.4.1 The archaeological sites within the study area are categorised in accordance with the only available criteria that are nationally agreed; these values are set out in the Department of Transport/Welsh Office/Scottish Office *Design Manual for Roads and Bridges* paragraph 3.4 Vol. 11 Section 3 Part 2 (HA 208/07 Cultural Heritage).
- Category A: national importance
 - Category B: regional importance
 - Category C: local importance
 - Category D: low importance
- To these an additional category has been added
- Category U: unknown
- 11.4.2 The assessment of the importance of individual sites is essentially a subjective exercise based upon the experience of the project team. The importance of certain sites will be implied by their status within the statutory framework. Scheduled Ancient Monuments will always be of national importance; Listed Buildings will be of at least regional importance. **Values** assigned to other sites are given both in relation to their individual importance and to their context within the wider landscape.
- 11.4.3 The **condition** of individual sites and the general overall condition of surviving remains has bearing on the value of the sites themselves and on the value that they impart within a wider landscape context. The condition of sites is recorded following the system used by the GGAT HER, using the following criteria:
- Intact: the site is intact
 - Near intact: the site is nearly intact
 - Damaged: the site has been moderately damaged
 - Near destroyed: the site has nearly been destroyed
 - Destroyed: the site has been destroyed
 - Restored: the site has been restored
 - Moved: the site has been moved (usually finds)
 - Not known: the condition of the site is not known

- 11.4.4 For the purposes of desk-based assessments, **rarity** is assessed at regional level only. The following criteria are used:
- High: very few sites of this type are known
 - Medium: the site is not unusual, but cannot be considered common
 - Low: the site is quite common
- 11.4.5 **Group association** is where a connection between sites within the landscape can be demonstrated. These will usually be of the same period, but may include groups where the presence of an earlier site or sites has led to the formation of a later complex, or where an earlier site or sites can be shown to have acquired importance as part of a later complex. The criteria are as follows:
- High: the site forms part of an interconnected complex occupying a clearly definable landscape where little or no fragmentation has occurred
 - Medium: the site is part of an interconnected complex, which is either limited in scope or badly fragmented
 - Low: there are few or no other sites, which are associated
- 11.4.6 **Historical association** is where there is a link between the site and known historical or cultural persons or events. Prehistoric sites, which are by definition before historical evidence, cannot have any contemporary historical association, but they may acquire later associations. For the Roman and Early-medieval periods, where survival of historical evidence is poor and patchy, any contemporary documentation at all will be important. Two classifications are given for historical association, one reflecting the certainty of the identification, and the other its importance. Only sites with certain or possible association can be assessed for importance, and historical association can only increase the importance of a site; the absence of it will never decrease its importance.
- Historical association- identification
- Certain
 - Possible
 - Unknown
- Historical association- importance
- High
 - Medium
 - Low
- 11.4.7 The assignment of values to identified interests requires consideration of the reliability and accuracy of the source data, ranging from fully-recorded features seen in open excavation to antiquarian comments on finds of note from a poorly-defined location. The confidence with which the values have been assigned is noted, using the following criteria:
- High: existing information is reliable and detailed
 - Medium: existing information is apparently reliable but limited in detail
 - Low: existing information is too limited to allow its reliability to be assessed
- 11.4.8 The **effect** of the proposal on the archaeological resource has been assessed using the following criteria:

- Severe: total loss
- Major: significant loss, likely to result in a reduction of value of the surviving site
- Minor: loss unlikely to result in a reduction of value of the surviving site
- None: no identifiable effect
- Beneficial: development will protect, preserve or enhance the site better than if the development did not occur

11.5. Indirect Effects (Monuments and Landscape settings)

- 11.5.1 Indirect effects identified for the archaeological resource include those of visibility and setting issues. Only monuments of National and Regional importance with a direct visual significance will be assessed for indirect effects. If the development is situated within (or sometimes in close proximity to) a Registered Historic Landscape then an ASIDOHL2 (Assessment of the Significance of the Impact of Development on Historic Landscape) assessment is usually required. Although the current development is not located within a Registered Historic Landscape, it is considered important to assess the potential indirect impact of the development upon the archaeological resource of the area.
- 11.5.2 The following indirect visual assessment does not conform to the full ASIDOHL2 methodology. However, in order to ensure a thorough evaluation, indirect effects have been assessed employing the *principles* of ASIDOHL2.
- 11.5.3 Indirect effects to category A and B sites will be measured against criteria for the assessment of indirect, visual impacts based upon the ASIDOHL2 methodology in *Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process* (2nd Edition 2007). The grading for the assessment is as follows:
- **Very severe:** the setting of, key views and/or essential lines of sight to and from the monument are dominated or obscured by the development. The form, scale and appearance, including motion, of the development, compromise the cultural integrity of the monument and its setting resulting in severance of historical links and/or degradation of an unaltered setting.
 - **Severe:** the setting of, key views and/or essential lines of sight to and from the monument are interrupted by the development. The form, scale and appearance, including motion, of the development, largely affects the cultural value of the monument and its setting resulting in possible severance of historical links and/or uncharacteristic change to a largely unaltered setting.
 - **Considerable:** the development is significantly visible in or interrupts the setting of, key views and/or essential lines of sight to and from the monument. The form and appearance, including motion of the development results in discordance with the monument and change to a largely unaltered setting.
 - **Moderate:** the development is visible in key views and/or essential lines of sight to and from the monument and it's setting. The form and appearance, including motion of the development results in discordance with the monument and/or alteration to its setting.
 - **Slight:** the development is noticeable in key views and/or essential lines of sight to and from the monument and it's setting. The form and appearance, including motion of the development is noticeable and results in minor alteration to the setting of the monument.

- **Very slight:** the development is barely noticeable within the setting of, key views and/or essential lines of sight to and from the monument. The setting is already largely altered and unsympathetic and/or the form and appearance, including motion of the development is barely noticeable and results in little discernible change to the setting.
- **None:** the development is not noticeable within the setting of, key views and/or essential lines of sight to and from the monument. The setting is already altered and unsympathetic and/or the form and appearance, including motion of the development is not noticeable and results in no discernible change to the setting.

11.5.4 The assessment of individual sites is essentially a subjective exercise based upon the experience of the project team. The following aspects will be considered when determining the results of the assessment.

- Any potential impacts that the development may have on the relationships of the monument to its surrounding landscape, including other monuments.
- The nature, extent and intrinsic value of the monument's setting, including its role in relation to the monument; the impact to both the immediate, essential setting and the wider setting is considered.
- Interference with the inter-visibility between the monument and other related monuments or particular landscape elements, impact to key viewpoints, vistas and lines of sight.

11.5.5 The purpose of the monument and significance of views to and from it will be considered in terms of visual intention. Whilst the location, construction and function of some monuments were specifically chosen to afford views of a particular area or monument(s), others may instead have been the targets of observation. The visual impact of the development in terms of form, scale, appearance and the effect of movement of constituent parts as well as the extent of encroachment of the development into the setting (both immediate and wider) of the monument should be considered.

11.5.6 Impacts to the direct lines of sight as well as impacts upon wider views of monuments will be determined and graded using the categories described above (very severe down to very slight).

11.6. Hedgerow Regulations

11.6.1 *The Environment Act 1995* (section 95) allowed regulations to be drawn up to protect important hedgerows from activities that were not subject to planning consent. *The Environment Act 1995 Hedgerow Regulations 1997* were specifically intended to provide objective criteria of importance which could be applied consistently across England and Wales. Thus although administered by the local planning authorities, the opportunity to develop local criteria for protection was restricted to designation as a key landscape characteristic for development control purposes (Section 7b ii) by the relevant date (April 1997). The regulations permit the removal of any hedgerow (including any stretch of hedgerow) for 'carrying out development for which planning permission has been granted' on the basis that the development control process provides a framework for weighing up the loss of hedgerows against the benefits of a proposal. Thus in such a context the significance of any surviving hedgerows needs to be considered.

11.6.2 The regulations were the subject of a review by the Department of the Environment, Transport and the Regions, *Review of the Hedgerow Regulations 1997* (1998), which suggested a simplified set of criteria, notably to include all pre-1845 or pre-1800 hedgerows where the field system is substantially complete. The Government noted the proposed changes but has not endorsed them (*The Government's response to the Environment, Transport and Regional Affairs Committee's Report 'The Protection of Field Boundaries' 1999*). The 1997 criteria therefore remain in force. Judicial Review of the application of the regulations (Flintshire County Council v NAW and Mr J T Morris) has clarified the interpretation of some of the criteria.

11.6.3 The criteria of historic importance in *The Hedgerow Regulations 1997* can be summarised as:

- marking a parish or township boundary
- incorporating or associated with a Scheduled Ancient Monument or site on the SMR at the relevant date
- marking a pre-1600 AD manor or estate boundary, or related to a building of such a manor or estate
- part of a field system pre-dating 1845 shown on a map in Record Office
- part of a pre-1845 field system that is substantially complete
- part of a pre-1845 field system where the pattern was identified in 1997 as a key landscape characteristic

There are other criteria relating to rights of way and ecology.

11.7. Baseline conditions

11.7.1 The 2002 assessment noted the presence of 200 sites of archaeological interest within the study area, including 46 Listed Buildings and 2 Scheduled Monuments, specifically Swansea 'New' Castle (GM012) and Swansea Castle (GM441). It also noted that part of the Tennant Canal (GM394) lies adjacent of the site, but this section is not scheduled, and that the study area also includes a conservation area, the Maritime Quarter. The report contained a full and detailed archaeological and historical background, as well as a review of historical and cartographic sources.

11.7.2 Of the 200 identified sites, fourteen were located within or immediately adjacent to the proposed redevelopment site, including three Listed Buildings. It also demonstrated that approximately 3.5m of made-ground existed across the site and where the dock and associated features and industries have been constructed; there has been severe disturbance and removal of deposits (2002 WAES). However, the assessment notes that significant paleoenvironmental data may survive in peat deposits that geotechnical investigations have proved to exist in at least parts of the site. It is also possible that a buried landscape underlies the peat, potentially containing evidence of Mesolithic or earlier date (2002 WAES).

11.7.3 The assessment recommends that any adverse effect of the development be mitigated by means of an archaeological watching brief following the removal of made ground and during any excavations in excess of 3m below the current ground surface; a survey of any affected parts of the Listed Buildings, as well as a survey of any affected, newly identified features of low archaeological importance (2002 WAES).

- 11.7.4 Utilising an identical study area (see Figure at Appendix 11.2), the current assessment has identified an additional 128 sites (see Appendix). These include five Listed Buildings, Swansea Maritime and Industrial Museum (05320w/405898/LB11598), New Cut Iron Bollard (05902w/310391/LB82484), War Memorial (310384/LB82485), Swansea Museum Wall and Railings (LB11654) and 51 and 52 Wind Street (LB11664). No historically significant hedgerows are present in the development area. A review of historic mapping of the area identified no new sites.
- 11.7.5 Five digit numbers with a letter suffix (w) are Primary Record Numbers (PRNs) recorded in the regional HER. Three-six figure numbers without a letter suffix are National Primary Record Numbers (NPRNs) of the NMR, as supplied to the HER under the ENDEX agreement. Listed Buildings are noted with the prefix 'LB', as supplied to the HER by Cadw. Numbers with a 'NMW' prefix are artefacts on the National Museum of Wales database, whereas numbers with a 'PAS' prefix are artefacts recorded under the Portable Antiquity Scheme.

11.8. Effects of construction and operational phases

- 11.8.1 The type of construction activities associated with the current development, such as excavations for building foundations, drainage, services, landscaping, etc. all have the potential to adversely affect the archaeological resource. In particular there is a provision for areas of underground car parking for the residential plots of the Peninsula and which will require excavations to a considerable depth. It is likely that any potential adverse effects of the development will occur during the construction phase, and it is considered that the operational phase of the development will not adversely affect the archaeological resource.
- 11.8.2 The main direct impact of the development will likely be due to the physical intrusion into, and subsequent damage of, archaeological features and structures, with both above-ground and below-ground assets being subject to such an effect. Furthermore, vibration from construction activities may adversely affect archaeologically significant sites, as well as hydrological changes causing potential damage to paleoenvironmentally significant peat deposits that are known to exist in the area (2002 WAES).

11.9. Assessment

Direct Effect

- 11.9.1 A total of 47 sites are located within the development area (see Table 11.2 and Figure at Appendix 11.4). These include two Listed Buildings, the J Shed (05403w/301404/LB25064) and the Flag Ship Building (07636w/699/33320/LB11728). Sites coloured in blue in Table 11.2 and 11.3 are located within or close to the UWTSO development plots on the Peninsula cluster, sites coloured in red are in or close to plots under the control of UWTSO outside the Peninsula, and sites coloured in black are in or close to plots not controlled by UWTSO.
- 11.9.2 A total of ten sites are located within or close to the UWTSO development plots on the Peninsula cluster, two sites are located in or close to plots under the control of UWTSO outside the Peninsula, with the remaining 35 sites located in or close to plots not controlled by UWTSO. As a result only twelve sites are located in areas subject to the 2015 masterplan changes (see Table 11.3).

ID	Site Name	NGR	Period	Condition	Rarity	Group Association	Historical Association	Confidence	Value	Effect
07225w	Prince of Wales Dock	SS6671092900	Post-medieval	Intact	Low	Medium	Certain (high)	High	C	Beneficial
07239w	Prince of Wales Dry Dock	SS6682192702	Post-medieval	Damaged	Low	High	Unknown	Medium	C	Beneficial
01701.2w	Riverside Terminus	SS66259313	Post-medieval	Near destroyed	Low	High	Certain (low)	High	C	Major
02819.0w	Vale of Neath Railway	Linear	Post-medieval	Near destroyed	Low	High	Unknown	High	C	Major
07227w	Patent Fuel Works	SS6649193054	Post-medieval	Near destroyed	Low	Medium	Certain (low)	Medium	C	Major
07238w	Lock	SS6672692729	Post-medieval	Not known	Low	Medium	Unknown	Medium	C	Major
02657w/305555	Norwegian Church (Sjomanns Kirken)	SS6642593023	Modern	Moved	High	Low	Certain (high)	High	B	None
07636w/699/33320/LB11728	The Flag Ship Building	SS6634292979	Post-medieval	Near intact	High	Medium	Unknown	High	B	None
00444w/412376	St Thomas's Chapel	SS66689294	Medieval	Destroyed	High	Low	Certain (Medium)	Low	C	None
01974w/19116	Lambert's Cottages	SS67379276	Post-medieval	Destroyed	Low	High	Unknown	Medium	C	None
03114w/706	East Pier	SS6677692521	Post-medieval	Destroyed	Low	High	Unknown	High	C	None
03121w	Salthouses	SS6793	Post-medieval	Not known	Medium	Low	Unknown	Low	C	None
03167w	Brass Coins	SS67259290	Roman	Moved	High	Low	Unknown	High	C	None
05403w/301404/LB25064	J-Shed Warehouse	SS66409297	Post-medieval	Intact	Low	High	Unknown	High	C	None
05785w	Northern Wall at Prince of Wales Dock	SS67279305	Post-medieval	Destroyed	Low	High	Unknown	High	C	None
07217w	Oyster Beds	SS6647993005	Post-medieval	Near destroyed	Low	Low	Unknown	Low	C	None
07218w	Eastern Depot	SS6632593149	Post-medieval	Destroyed	Low	High	Certain (low)	Low	C	None
07224w	Smithy	SS6684293039	Post-medieval	Destroyed	Low	Low	Unknown	Medium	C	None
07234w	Tin Plate Shed 1	SS6662792806	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07235w	Tin Plate Shed 2	SS6664492757	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07236w	Tin Plate Shed 3	SS6679492794	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07237w	Tin Plate Shed 4	SS6666492714	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07240w	Goods Shed	SS6645792906	Post-medieval	Destroyed	Low	Medium	Unknown	Medium	C	None
07241w	Landing Stage	SS6638592884	Post-medieval	Destroyed	Low	Medium	Unknown	Low	C	None
07242w	Harbour Master's Office	SS6675592696	Post-medieval	Destroyed	Low	Medium	Unknown	Low	C	None
07243w	Swing Bridge	SS6673292781	Post-medieval	Destroyed	Low	Medium	Unknown	Low	C	None
07244w	East Dock Station	SS6670093148	Post-medieval	Destroyed	Low	Medium	Unknown	Medium	C	None
07588w/270842	Observation Post	SS6674892697	Modern	Destroyed	High	High	Unknown	Medium	C	None
24958	New Mill	SS6793	Post-medieval	Not known	Low	Medium	Unknown	Low	C	None
403571	Port Tennant Tidal Dock	SS6793	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
411304	Canal Lock	SS67099285	Post-medieval/Modern	Not known	Low	High	Unknown	Low	C	None
8969	Graig Chapel	SS6793	Post-medieval	Not known	Low	High	Unknown	Low	C	None
8970	Hen Gapel	SS6793	Post-medieval	Not known	Low	High	Unknown	Low	C	None
9053	Port Tennant Chapel	SS6793	Post-medieval	Not known	Low	High	Unknown	Low	C	None
07219w	Limekiln	SS6626293088	Post-medieval	Near destroyed	Low	Low	Unknown	Low	D	None
07220w	Saw Pit	SS6629893033	Post-medieval	Near destroyed	Low	Low	Unknown	Medium	D	None
07226w	Stage	SS6645993028	Post-medieval	Near destroyed	Low	Medium	Unknown	Medium	D	None
07228w	Railway Turntable	SS6654393025	Post-medieval	Near destroyed	Low	Medium	Unknown	Low	D	None
07229w/34280	Coal Hoist	SS6657392995	Post-medieval	Near destroyed	Low	Medium	Unknown	Medium	D	None

ID	Site Name	NGR	Period	Condition	Rarity	Group Association	Historical Association	Confidence	Value	Effect
07231w	Structure	SS6656493024	Post-medieval	Near destroyed	Low	Medium	Unknown	Low	D	None
07232w	Structure	SS6659993018	Post-medieval	Near destroyed	Low	Medium	Unknown	Low	D	None
07233w	Structure	SS6658192997	Post-medieval	Near destroyed	Low	Low	Unknown	Low	D	None
07245w	Structure	SS6649493040	Post-medieval	Destroyed	Low	Low	Unknown	Medium	D	None
07246w	Structure	SS6649693006	Post-medieval	Destroyed	Low	Low	Unknown	Medium	D	None
07247w	Sand Bin	SS6656893003	Post-medieval	Destroyed	Low	Low	Unknown	Medium	D	None
07248w	Warehouse	SS6655393080	Post-medieval	Destroyed	Low	Low	Unknown	Medium	D	None
34284	North Docks Bollard	SS672930	Post-medieval	Destroyed	Low	High	Unknown	Medium	D	None

Table 11.2. Sites located within the development area

ID	Site Name	NGR	Period	Condition	Rarity	Group Association	Historical Association	Confidence	Value	Effect
07239w	Prince of Wales Dry Dock	SS6682192702	Post-medieval	Damaged	Low	High	Unknown	Medium	C	Beneficial
07238w	Lock	SS6672692729	Post-medieval	Not known	Low	Medium	Unknown	Medium	C	Major
01974w/19116	Lambert's Cottages	SS67379276	Post-medieval	Destroyed	Low	High	Unknown	Medium	C	None
03114w/706	East Pier	SS6677692521	Post-medieval	Destroyed	Low	High	Unknown	High	C	None
07234w	Tin Plate Shed 1	SS6662792806	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07235w	Tin Plate Shed 2	SS6664492757	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07236w	Tin Plate Shed 3	SS6679492794	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07237w	Tin Plate Shed 4	SS6666492714	Post-medieval	Destroyed	Low	High	Unknown	Low	C	None
07242w	Harbour Master's Office	SS6675592696	Post-medieval	Destroyed	Low	Medium	Unknown	Low	C	None
07243w	Swing Bridge	SS6673292781	Post-medieval	Destroyed	Low	Medium	Unknown	Low	C	None
07588w/270842	Observation Post	SS6674892697	Modern	Destroyed	High	High	Unknown	Medium	C	None
411304	Canal Lock	SS67099285	Post-medieval/Modern	Not known	Low	High	Unknown	Low	C	None

Table 11.3 Sites located in areas subject to the 2015 masterplan changes

11.10. Assessment of Effects (Direct)

- 11.10.1 It has been assessed that the proposed overall development will have a 'Beneficial' effect on two sites, the Prince of Wales Dock (07225w) and the Prince of Wales Dry Dock (07239w) and a 'Major' effect on four sites, Riverside Terminus (01701.2w), Vale of Neath Railway (02819.0w), Patent Fuel Works (07227w) and Lock (07238w).
- 11.10.2 However, only the Prince of Wales Dry Dock (07239w) and the Lock (07238w) are located in the area subject to the 2015 masterplan changes. As a result the 2015 changes will have a 'Beneficial' effect on a single site (07239w) and a 'Major' impact on a single site (07238w).
- 11.10.3 The overall development will both preserve and enhance the structures of the Prince of Wales Dock (07225w) and the Prince of Wales Dry Dock (07239w), furthermore the development will restore links between the Dock/Dry Dock and part of the old tidal basin and the River Tawe. The development is also designed to increase the volume of visitors to what was originally a culturally vibrant and socially diverse area of Swansea.
- 11.10.4 The Riverside Terminus (01701.2w), Vale of Neath Railway (02819.0w) and Patent Fuel Works (07227w) are all located in the proposed positions of buildings granted under outline planning permission 2008/0996 in October 2010 (see Figure 11.2). However, no above-ground structures associated with any of these sites are apparent, and the potential 'Major' effect is based on the assumption that below-ground elements of the structures survive and will be encountered during the construction of buildings associated with the development. No changes are proposed to the masterplan when compared to the 2010 scheme in these areas. Similarly, no above ground elements of the Lock (07238w) survive and the potential 'Major' effect is based on the assumption that below-ground elements of the structures will be encountered during the construction phase. However, on the 2015 masterplan, a number of buildings are shown on the line of the Lock, whereas an access road was indicated on the 2010 masterplan, increasing the likelihood of encountering any surviving remains due to the greater depth of the requisite excavations.
- 11.10.5 The majority of the identified sites within the development area relate to the original structural features of the docks and associated industrial buildings. However, most of these have been demolished over the course of the 20th century. Furthermore such sites are generally of 'Local' or 'Low' archaeological importance (Values C or D). Two sites of 'Regional' importance (Value B) are present, the two Listed Buildings, J Shed (05403w/301404/LB25064) and the Flag Ship Building (07636w/699/33320/LB11728). However, the development works associated with both Listed Buildings have been completed as part of previous masterplans, and neither will be directly affected by the current proposals.
- 11.10.6 Map regression work (2002 WAES and 2010 (AES) has indicated that a large section of the development area is reclaimed land, which was previously intertidal mud (1st edition OS map of 1878). It suggests that excavated material during the construction of the Prince of Wales Dock has been used to create a significant depth of made-ground (approximately 3.5m) across the proposed development. Such reclaimed land has a low potential for the presence of previously unknown structures of archaeological interest. However, geotechnical investigations (2002 WAES) have identified peat deposits, up to 4m in depth, below the made ground in the eastern part of the site and alluvial deposits containing peat elsewhere in the development. Despite the presence of such paleoenvironmentally important material, it is located below approximately 3.5m of made ground and so will only be directly affected by excavations of a similar depth. The 2010 update noted that the only potential threats to the peat deposits are from the excavation of underground car parking, although as it is likely that such excavations will reach a maximum depth of 2m below the current ground surface, it is possible that such excavations will not encounter any peat.

Indirect effect

11.10.7 It has been assessed that a total of ten sites of National or Regional importance (Value A or B) may be subject to an indirect effect by the overall proposed development (see Table 11.4 and Figure 11.4). However it should be noted that a single designation has been attributed to site 00943w/LB11560-11567 (6-13 Cambrian Place), which contains a group of seven Listed Buildings, as well as to site 02362w/32812/LB11599/LB11600 (Bollards) which contains two Listed Buildings.

11.10.8 Photographic plates are provided at Appendix 11.5.

ID	Name	NGR	Period	Value	Effect	Distance from development
00942w/LB11563	9 Cambrian Place	SS6608992807	Post-medieval	B	Very Slight	296m
00943w/LB11560-11567	6-13 Cambrian Place	SS66119282	Post-medieval	B	Very Slight	278m (min.)
01473w/145/LB11643	Old Guildhall	SS662929	Post-medieval	B	Slight	207m
01499w/31738/LB11559	5 Cambrian Place	SS6607092801	Post-medieval	B	Very Slight	287m
02362w/32812/LB11599/LB11600	Bollards	SS661933	Post-medieval	B	Slight	130m
02399w/34282/LB11655	Pilot House	SS663925	Post-medieval	B	Considerable	155m
05403w/301404/LB25064	J-Shed Warehouse	SS66409297	Post-medieval	B	Moderate	0km
07559w/13557/LB82482	Church of St Thomas	SS6661993243	Post-medieval	B	Slight	69m
07636w/699/33320/LB11728	The Flag Ship Building	SS6634292979	Post-medieval	B	Moderate	0m

Table 11.4. Archaeological sites subject to an indirect effect

11.10.9 Number 9 Cambrian Place (00942w/LB11563), 6-13 Cambrian Place (00943w/LB11560-11567) and 5 Cambrian Place (01499w/31738/LB11559) (See Figure 11.3 and Plate 11.1, Viewpoint 1)

11.10.10 These Listed Buildings are located to the west of the River Tawe and form part of terrace of uniform, late Georgian houses. The key view is to the east/west along Cambrian Place, although the buildings of Cambrian Place form a visual tunnel, resulting in a restricted field of view and greatly restricting any visual impact. Furthermore, to a large extent the view to the development is already largely altered by buildings that were constructed as part of the earlier masterplans, again reducing any indirect impact. As a result it is assessed that the indirect impact on these three sites will be 'Very Slight'.

Old Guildhall (01473w/145/LB11643) (See Figure 11.3 and Plate 11.2, Viewpoint 2)

- 11.10.11 The Old Guildhall is a large public building located to the west of the River Tawe and standing in its own grounds. The key views are to the west, south and east. The view to the east, towards the development area, is much more open than the Cambrian Place buildings, although again the view is already largely altered by buildings that were constructed as part of the earlier masterplans, further reducing any indirect impact. As a result it is assessed that the indirect impact will be 'Slight'.

Bollards (02362w/32812/LB11599/LB11600) (See Figure 11.3 and Plate 11.3, Viewpoint 3)

- 11.10.12 These Listed Buildings are a pair of iron bollards set back from the quay wall on the west bank of the River Tawe. The key views are to the north and south, associated with the river. The view towards the development is partially blocked by existing vegetation and housing, as well as being already largely altered by buildings that were constructed as part of the earlier masterplans, further reducing any indirect impact. As a result it is assessed that the indirect impact will be 'Slight'.

Pilot House (02399w/34282/LB11655) (See Figure 11.3 and Plate 11.4, Viewpoint 4)

- 11.10.13 This Listed Building is a former pilot's house at the pierhead on the west bank of the River Tawe. The key view is to the northeast, over the River Tawe towards the current development. This view has already been partially altered by the construction of buildings that were part of the earlier masterplans, although the view towards a group of new buildings in the southernmost extent of the development, the 'Peninsula', will be unimpeded. As a result it is assessed that the indirect impact will be 'Considerable'.

J-Shed Warehouse (05403w/301404/LB25064) (See Figure 11.3 and Plate 11.5, Viewpoint 5)

- 11.10.14 This Listed Building is located within the site and has been incorporated into the development, with all construction works having been completed as part of previous masterplans. The key view is out over the Prince of Wales dock to the east and northeast. However, it should be noted that such a view has already been largely altered by buildings that were constructed as part of the earlier masterplans. As a result it is assessed that the indirect impact will be 'Moderate'.

Church of St Thomas (07559w/13557/LB82482) (See Figure 11.3 and Plate 11.6, Viewpoint 6)

- 11.10.15 The church is a prominent Anglican parish church located to the north of Fabian Way. It is surrounded by housing with the only remaining lines of sight being north-south along Maes Street and Lewis Street, with the development located to the southwest, south and southeast. The view to the development has already been largely altered by the construction of Fabian Way, buildings that were constructed as part of the earlier masterplans and is partially blocked by existing vegetation and housing. As a result it is assessed that the indirect impact will be 'Slight'.

Flag Ship Building (07636w/699/33320/LB11728) (See Figure 11.3 and Plates 11.7 and 11.8, Viewpoints 7 and 8)

- 11.10.16 This Listed Building is located within the site and has been incorporated into the development, with all construction works having been completed as part of previous masterplans. The key view is to the southwest, over the River Tawe away from the current development, which will be unaltered by the development (Viewpoint 7). Conversely, the view to the Warehouse (Viewpoint 8) along this same line of sight will be changed, with new buildings proposed to both the north and south of the existing structure. However, it should be noted that such a view has already been largely altered by buildings that were constructed as part of the earlier masterplans. As a result it is assessed that the indirect impact will be 'Moderate'.
- 11.10.17 The previous assessments (2002 and 2010) did not consider any potential indirect visual effects of the development on archaeological sites. As a result the current assessment has considered the indirect visual effects of the entire development area, rather than being restricted to the areas subject to the 2015 masterplan changes. Such a comprehensive methodology is designed to meet current professional standards, thus insuring a greater integrity of assessment and output of results. However, it is likely that if the areas subject to the 2015 masterplan changes were considered in isolation, then the indirect visual impacts on the sites noted above (see Table 11.4) would be lessened.

11.11. Mitigation

- 11.11.1 Two sites of archaeological interest, the Prince of Wales Dry Dock (07239w) and the Lock (07238w), are located in the area subject to the 2015 masterplan changes. It has been assessed that the 2015 changes will have a 'Beneficial' effect on the Prince of Wales Dry Dock (07239w) and a 'Major' impact on the Lock (07238w).
- 11.11.2 The Riverside Terminus (01701.2w), Vale of Neath Railway (02819.0w) and Patent Fuel Works (07227w) are all located in the proposed positions of buildings granted under outline planning permission 2008/0996 in October 2010 (see Figure 11.1). However, no above-ground structures associated with any of these sites are apparent, and the potential 'Major' effect is based on the assumption that below-ground elements of the structures survive and will be encountered during the construction of buildings associated with the development. No changes are proposed to the masterplan when compared to the 2010 scheme in these areas.
- 11.11.3 Similarly, no above ground elements of the Lock (07238w) survive and the potential 'Major' effect is also based on the assumption that below-ground elements of the structures will be encountered during the construction phase. However, on the 2015 masterplan, a number of buildings are shown on the line of the Lock, whereas an access road was indicated on the 2010 masterplan, increasing the likelihood of encountering any surviving remains due to the greater depth of the requisite excavations.
- 11.11.4 Consequently, any intrusive groundworks required for the construction of the buildings located on the positions of such sites (buildings outlined in red on Figure 11.2) will require an archaeological watching brief in order to record any surviving features or structures.
- 11.11.5 Geotechnical investigations (2002 WAES) have identified peat deposits, up to 4m in depth, below approximately 3.5m of made ground in the development. The 2010 update (2010 AES) noted that the only potential threats to the peat deposits are from the excavation of underground car parking, although as it is likely that such excavations will reach a maximum depth of 2m below the current ground surface, it is possible that such excavations will not encounter any peat. Nevertheless, any such excavations should be monitored by an archaeological watching brief, with a particular emphasis on a peat sample strategy and subsequent analysis.

Residual Effects

- 11.11.6 The above mitigation measures are designed to reduce the adverse effect of the development on four sites of archaeological interest from 'Major' to 'None' by providing suitable preservation by record of any surviving remains. As a result the residual effect will be 'None'.

11.12. Conclusion

- 11.12.1 The purpose of this chapter is to assess the potential for the development to give rise to effects on the archaeological resource, as well as to devise suitable mitigation methods to reduce any adverse effect and enhance any beneficial effect. The assessment reviewed current information regarding the archaeological resource of the study area, updating the initial desk-based assessment conducted in 2002 (2002 WAES), with an addendum in 2010 (2010 AES).
- 11.12.2 The 2002 assessment noted the presence of 200 sites of archaeological interest within the study area, which included land beyond the current planning application site boundary (see Figure 11.1). Utilising an identical study area, the current assessment has identified an additional 128 sites (see Table 11.1). A total of 47 sites are located within the development area (see Table 11.2 and Figure 11.1). These include two Listed Buildings, the J Shed (05403w/301404/LB25064) and the Flag Ship Building (07636w/699/33320/LB11728).
- 11.12.3 It has been assessed that the proposed overall development will have a 'Beneficial' effect on two sites, the Prince of Wales Dock (07225w) and the Prince of Wales Dry Dock (07239w) and a 'Major' effect on four sites, Riverside Terminus (01701.2w), Vale of Neath Railway (02819.0w), Patent Fuel Works (07227w) and Lock (07238w).
- 11.12.4 However, only the Prince of Wales Dry Dock (07239w) and the Lock (07238w) are located in the area subject to the 2015 masterplan changes. As a result the 2015 changes will have a 'Beneficial' effect on a single site (07239w) and a 'Major' impact on a single site (07238w).
- 11.12.5 Furthermore, it is considered that the development will have an indirect effect on a total of ten sites of Regional importance (see Table 11.4 and Figure 11.3), with magnitudes of effect ranging from 'Very Slight' to 'Considerable'. However, the previous assessments (2002 and 2010) did not consider any potential indirect visual effects of the development on archaeological sites. As a result the current assessment has considered the indirect visual effects of the entire development area, rather than being restricted to the areas subject to the 2015 masterplan changes. However, it is likely that if the areas subject to the 2015 masterplan changes were considered in isolation, then the indirect visual impacts on the sites noted above would be lessened.
- 11.12.6 The Riverside Terminus (01701.2w), Vale of Neath Railway (02819.0w), Patent Fuel Works (07227w) and Lock (07238w) are all located in the proposed positions of buildings (see Figure 11.2). Consequently, any intrusive groundworks required for the construction of such buildings will require an archaeological watching brief in order to record any surviving features or structures.
- 11.12.7 Additionally, geotechnical investigations (2002 WAES) have identified peat deposits, up to 4m in depth, below approximately 3.5m of made ground in the development. The 2010 update (2010 AES) noted that the only potential threats to the peat deposits are from the excavation of underground car parking. Any such excavations should also be monitored by an archaeological watching brief, with a particular emphasis on a peat sample strategy and subsequent analysis.
- 11.12.8 The above mitigation measures are designed to reduce the adverse effect of the development on four sites of archaeological interest from 'Major' to 'None' by providing suitable preservation by record of any surviving remains. As a result the residual effect will be 'None'.

12. Waste and Recycling

12.1. Introduction

- 12.1.1 The assessment of waste and recycling contained in the 2002 WAES and supplemented by the 2010 AES addressed the management of waste and recycling for the SA1 development. This chapter contains an assessment of the change in impact due to the updated masterplan. The main change to the masterplan is that the area previously identified for a mixed use, leisure led scheme is now proposed as a mixed use, education led masterplan scheme. As such, this assessment will focus on the impact of this change.
- 12.1.2 Since 2010 a number of the identified development plots have been completed. The majority of on-site demolition works and cut-fill earthworks operations required for the Scheme have been completed under previous phases, and as such only minor demolition and excavation works remain to be undertaken.

Policy and Legislative Context

- 12.1.3 The 2002 WAES identifies the key legislation and policies relevant to the project. The 2010 AES noted the following documents published following completion of the 2002 WAES:
- Wise About Waste: The National Waste Strategy for Wales (June 2002)
 - The South West Wales Regional Waste Plan (November 2003)
 - The South West Wales Regional Waste Plan First Review (August 2008)
 - Swansea Unitary Development Plan (November 2008)
- 12.1.4 In addition, the following legislation and documents relevant to waste management have been published since the 2010 AES:
- Waste (Wales) Measure 2010
 - Waste (England and Wales) Regulations 2011 as amended
 - Towards Zero Waste (June 2010)
 - Collection Blueprint, Welsh Government (2011)
- 12.1.5 These documents develop the previously identified sustainable and integrated approaches to waste management and minimisation, promote the key principles of Best Practical Environmental Option, regional self-sufficiency, the proximity principle and the waste hierarchy.

Methodology and Assessment Criteria

- 12.1.6 This assessment identifies the environmental impacts associated with waste arisings from the different phases of the Scheme and the measures which will be implemented to mitigate these impacts.

Study Area

- 12.1.7 For the purpose of this assessment the study area comprises CD&E (Construction, Demolition and Excavation) waste arisings and current waste management facilities across Wales and operational waste arisings and waste management infrastructure in Swansea. The study area does not include the operation of the waste management facilities.

Assessment Criteria

- 12.1.8 In order to assess the significance of the impacts of associated with waste produced by the Scheme the sensitivity of waste arisings has been based on the waste management infrastructure capacity within the study area for any waste arisings from the Scheme. Assessing the scale and significance of the impacts associated with the production and management of waste has been based on a combination of the waste management methods identified and the effects that forecast waste arisings will have on available waste management infrastructure. In this way, the assessment reflects both the quantities of waste produced (relative to the capacities of the available waste infrastructure) and the position within the waste hierarchy of the chosen waste management methods.
- 12.1.9 The importance or sensitivity of each resource is assessed using the criteria provided in Table 12.1.

Importance/ sensitivity of resource or receptor	Criteria
Very High	There is no available waste management infrastructure capacity within the study area for any waste arisings from the Scheme. Very limited materials reuse, recycling and or recovery.
High	There is limited waste management infrastructure capacity within the study area in relation to the forecast waste arisings from the Scheme. Limited materials reuse, recycling and or recovery.
Medium	There is adequate waste management infrastructure capacity within the study area for the majority of waste arisings from the Scheme. Moderate materials reuse, recycling and or recovery.
Low	There is adequate available waste management infrastructure capacity within the study area for all waste arising from the Scheme. High materials reuse, recycling and or recovery.
Negligible	There is waste management infrastructure capacity within the study area for all waste arisings from the Scheme. Very high materials reuse, recycling and or recovery.

Table 12.1 Assessment Criteria

12.1.10 The magnitude of each impact is assessed using the criteria provided in Table 12-2.

Magnitude of Impact	Criteria
Major	Waste arisings from the Scheme are predominantly disposed of to landfill or to incineration without energy recovery with little or no prior segregation. Generation of large quantities of hazardous and inert waste which are managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery).
Moderate	Waste arisings from the Scheme are predominantly disposed of by incineration with energy recovery. Generation of moderate quantities of hazardous and inert waste which are managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery).
Minor	Waste arisings from the Scheme are predominantly segregated and sent for composting, recycling or for further segregation and sorting at a materials recovery facility. Generation of small quantities of hazardous and inert waste which is managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery).
Negligible	Waste arisings from the Scheme are predominantly reused on site or at an appropriately licensed or registered exempt site elsewhere. Generation of negligible quantities of hazardous and inert waste which are managed for disposal using methods lower down the Waste Hierarchy (e.g. landfill or incineration with energy recovery).
No Change	All waste arisings from the Scheme are reused on site or at an appropriately licensed or registered exempt site elsewhere. No generation of hazardous waste. All inert materials reused onsite.

Table 12.2 Assessment Magnitude Criteria

12.1.11 The significance of each impact is assessed using the criteria provided in Table 12.3.

Magnitude of Impact	Sensitivity of the receptor				
	Very High	High	Medium	Low	Negligible
Major	Very Large	Large or Very Large	Moderate or Large	Slight or Moderate	Slight
Moderate	Large or Very Large	Moderate or Large	Moderate	Slight	Neutral or Slight
Minor	Moderate or Large	Slight or Moderate	Slight	Neutral or Slight	Neutral or Slight
Negligible	Slight	Slight	Neutral or Slight	Neutral or Slight	Neutral
No Change	Neutral	Neutral	Neutral	Neutral	Neutral

Table 12.3 Assessment Significance Criteria

12.2. Baseline Conditions

- 12.2.2 12,200,000 tonnes of CD&E waste was produced in Wales in 2005/6 (Stats Wales). CD&E data for Swansea is not available. There is limited waste infrastructure for CD&E waste within Swansea and South Wales. The nearest CD&E recycling centre is Graigola Wharf reclamation & recycling centre.
- 12.2.3 The 2002 WAES reported that 99,280 tonnes of household waste and 119,963 tonnes of municipal waste were disposed to landfill in 2000/2001.
- 12.2.4 Stats Wales data for waste collection and recycling in Swansea for the period 2012/13 is shown in Table 12.4 below:

Total Municipal Waste Collected/Generated in Swansea (tonnes) 2012/13								Total Municipal Waste Collected/Generated
Municipal Waste Reused/Recycled		Municipal Waste Reused/Recycled	Municipal Waste Composted		Municipal Waste Composted	Residual Household Waste	Residual Non-Household Waste	
Household Waste Reused/Recycled	Non-Household Waste Reused/Recycled		Household Waste Composted	Non-Household Waste Composted				
28,235	10,290	38,525	18,330	1,070	19,400	46,104	9,599	113,627

Table 12.4 Total Municipal Waste Collected/Generated in Swansea (tonnes) 2012/13 [ref Stats Wales]

- 12.2.5 The City and County of Swansea Council strategy for waste aims to work towards meeting the Welsh Government target of 70% recycling set for 2025. Current targets for recycling are 58% by 2015/16 and 64% by 2019/20.
- 12.2.6 The County Council initiatives to promote recycling include:
- Annual “Wise up to Waste Week” to raise awareness
 - Swansea Schools Recycling programme
 - Online Swap Shop to exchange unwanted goods
 - Working with communities having a “low participation” rate.
 - Regular press releases
 - “Little Green Book” – publication detailing steps residents can take to reduce and minimise waste.
- 12.2.7 Since the 2002 WAES and 2010 AES was produced, the City and County of Swansea Council has improved its waste management including kerbside collection schemes for the recycling of paper, cardboard, glass, metal, plastics and domestic food waste. These are collected via segregated plastics, cardboard/ paper, metals & glass with weekly food waste collections and fortnightly non-recyclable collections.
- 12.2.8 The council operates five Civil Amenity sites, the nearest to SA1 Swansea Waterfront being close by at Tir John.

12.3. Likely effects

- 12.3.2 The 2002 WAES identified that construction waste would be generated as a result of general handling losses and surpluses and that this would be mitigated via good site practices including; proper handling and storage, efficient purchasing, waste segregation in order to maximise reuse/recycling, and use of suppliers who reuse/recycle packaging.
- 12.3.3 The 2002 WAES stated that the recycling of demolition materials would result in a minor beneficial impact on mineral resources due to its contribution towards the conservation of resources. The disposal of residual waste to landfill was considered to be a minor adverse impact which would use up landfill capacity. The 2010 AES noted that if the site was not developed equivalent development would be likely to take place elsewhere in the Swansea area resulting in the predicted impact still occurring and that the overall the impact was considered to be relatively minor.
- 12.3.4 CD&E waste arisings for the development have been estimated using the 2013 SMARTWaste Data report from WRAP, which collates data from a number of projects and calculates average waste production key performance indicators. This data was not available at the time that the 2002 WAES and 2010 AES were produced. Using this data it is estimated that the Scheme will produce 12,025 tonnes more CD&E waste compared to 2010. However, as stated above, the major earthworks and demolition works have already been completed so the true forecast will be less than this. A detailed CD&E waste forecast will be produced for inclusion in the SWMP (Site Waste Management Plan) at a later stage of the design process and once the scheme is defined in more detail.
- 12.3.5 Table 12-5: CD&E waste produced by the scheme 2010 masterplan compared to 2015 masterplan.

Building type	2010		2015		Change		
	Floor area (m ²)	CD&E waste arisings (tonnes)	Floor area (m ²)	CD&E waste arisings (tonnes)	Floor area (m ²)	CD&E waste arisings (tonnes)	Increase / decrease
Leisure	12,304	738	4,790	287	7,514	451	↓
Education	1,036	241	34,116	7949	33,080	7,708	↑
Business*	84,437	45,849	98,810	53,654	14,373	7,805	↑
Residential	167,124	28,411	153,812	26,148	13,312	2,263	↓
Retail	14,864	1,516	12,109	1,235	2,755	281	↓
Hotel**	25,028	1,502	16,828	1,010	8,200	492	↓
Car park***	23,997	N/A	37,090	N/A	13,093	N/A	↓
Total	328,790	78,258	357,555	90,283	92,327	12,025	↑

*Figures for Offices used.

**Figures for Commercial other used as data for hotels is not available.

***Data not available.

- 12.3.6 Waste will be produced as part of the operation of the completed Scheme. Currently there are no guidelines relating to estimates of wastes produced by Universities. It is not possible at this stage to calculate an estimate for the volume of waste to be produced. The 2002 WAES estimated that no more than 1000 tonnes of waste would be produced per year and the 2010 ASE identified a 24% increase in floor area which it stated was comparable to a revised estimate of 1,240 tonnes of operational waste per year. The current proposed change to the masterplan represents less than a 10% increase in floor area and therefore the increased impact on existing waste management infrastructure is not significant.
- 12.3.7 Waste will be produced as part of the operation of the completed Scheme. Currently there are no guidelines relating to estimates of wastes produced by Universities. It is not possible at this stage to calculate an estimate for the volume of waste to be produced. The 2002 WAES estimated that no more than 1000 tonnes of waste would be produced per year and the 2010 ASE identified a 24% increase in floor area which it stated was comparable to a revised estimate of 1,240 tonnes of operational waste per year. The current proposed change to the masterplan represents less than a 10% increase in floor area and therefore the increased impact on existing waste management infrastructure is not significant.

12.4. Evaluation and significance of effects

- 12.4.2 Both the 2002 WAES and 2010 AES assessed the waste impact as minor in the context of development in the Swansea area.
- 12.4.3 The waste management infrastructure for CD&E waste is assessed to have high sensitivity due to the limited availability within the study area. The size of the impact is assessed to be minor as the project has a minimum 75% diversion from landfill target and the conservative estimate of the increase in CD&E waste to be produced by the Scheme represents less than 1% of the total CD&E waste produced in Wales. Therefore CD&E waste production is assessed to have a **slight/moderate adverse** impact.
- 12.4.4 There is adequate waste management infrastructure in the Swansea area to manage the expected operational waste arisings from the proposed masterplan and as such this is assessed to have a medium sensitivity. The size of the impact is assessed to be minor as the increase in operational is expected to be less than 10%. Therefore the operational waste production is assessed to have a **slight adverse** impact.

12.5. Proposed Mitigation

- 12.5.1 Designing out waste principles will be considered during the detailed design stages:
- 1) *Design for reuse and recovery of materials and components*
 - 2) *Design for off-site construction/manufacture*
 - 3) *Design for materials optimisation*
 - 4) *Design for efficient procurement and delivery systems*
 - 5) *Design for deconstruction, flexibility and adaptation*
- 12.5.2 As part of the best practice to be employed on site, a SWMP (Site Waste Management Plan) will be produced to manage and monitor construction, demolition and excavation waste. A minimum target of 75% by weight diversion from landfill target will be set with a stretch target of 90% by weight recycling, prep for reuse or recovery for use elsewhere of CD&E waste will be implemented.
- 12.5.3 Construction waste generation would be mitigated through the good site practices detailed below which will also be detailed in the CEMP (Construction Environmental Management Plan):

- “Just in time” deliveries to minimise opportunities for materials to be spoilt and become waste
- Correct storage and handling of materials on site
- Use of standard sizes whenever possible
- Off-site construction if possible; prefabricated products / modules; pre-cast units
- All waste will be segregated and as a minimum will include: hazardous, insulation and gypsum, metal, timber, plastic, inert waste, and general waste
- Take-back scheme arrangements with suppliers will be implemented; all packaging and pallets to be collected by suppliers and not broken up and skipped
- Reuse materials (i.e. all excavated materials) on site where possible; all brick and concrete crushed and reused on site; Re use of soils and cut-fill balance
- Work with all sub-contractors to identify waste minimisation; encourage all subcontractors to reuse or recycle their own waste materials
- All staff on site to be trained on how to minimise waste via induction, toolbox talks, inspections and meetings
- Efficient purchasing minimising over ordering to be implemented
- Use of suppliers who reuse/recycle packaging.

12.5.4 The 2002 WAES identified waste from the built environment (i.e. during the operational phase of the development) would be mitigated against by facilitating and encouraging recycling via paper collections, bottle banks, plastic, textile and metal can recycling points. During operation the County Council waste management initiatives including kerbside collection schemes would be promoted (e.g. via flyers to residents).

12.6. Residual Effects

12.6.2 Residual effects in relation to the 2015 masterplan scheme would be minimal compared to the 2002 and 2010 schemes.

12.6.3 CD&E waste generation will be minimised at source and at least 75% will be diverted from landfill. Residual effects are expected to be minor and temporary.

12.6.4 Residual operational waste would be minimised by encouraging segregation of waste for recycling with a target of 64%. Residual effects are therefore expected to be minor.

12.7. Cumulative Impacts

12.7.2 The Swansea University Bay Campus and the Swansea Tidal Lagoon would not directly increase the overall impact of the proposed development. During construction, the waste generated by the proposed developments is assessed to be minor and would not form a significant effect when combined with the Bay Campus and Lagoon projects particularly as these projects would have differing and non-coincident programmes and phasing. For operational use, the Lagoon would generate minimal domestic waste while the Swansea Bay campus is not expected to produce significant volumes of waste and therefore the impact is expected to be minor.

13. Infrastructure and Services

13.1. Introduction

- 13.1.1 The following chapter sets out the key changes in respect to infrastructure and services since the 2010 AES was prepared.

13.2. Baseline and Changes Since 2010

- 13.2.1 The existing infrastructure on the SA1 site provides for fully serviced development plots with connections to the adoptable highway and public drainage network. The primary road links contain foul drainage together with spurs for plot drainage and other utilities contained within the footways. The southern section of Kings Road and eastern section of Langdon Road although partially completed are intended to service the adjacent plots. At this stage it is understood that any works outside of the curtilage of the identified development plots to accommodate the new development would be progressed by Welsh Government.
- 13.2.2 Infrastructure works to complete the SA1 site will include the re-alignment of Marina Road to connect with Langdon Road and a new pedestrian footbridge linking the proposed SA1 development with Plots E & F. This will create new development plots and provide links/access to larger site infrastructure network.
- 13.2.3 There are highways and utilities in Kings Road and Langdon Road which are the main access roads to the development plots. The proposals will increase vehicular traffic and utilities demand compared to the current position, however, the SA1 development has been designed to accommodate the development of the whole of the site and there are no major alterations required to the as-built infrastructure resulting from the revised masterplan proposals.
- 13.2.4 There are primary infrastructure utilities services routed around the SA1 providing a robust backbone of infrastructure services. The utilities service providers include the following:
- Western Power Distribution – Electrical Power
 - Wales & West Utilities - Gas
 - Dwr Cymru Welsh Water – Water Supplies
 - British Telecom - Telecommunications
 - Virgin Media- Telecommunications
- 13.2.5 An existing service shaft and tunnel below the water passage connecting the Prince of Wales and Kings Docks was created prior to 2010 to permit the potential to complete the circuit around the Prince of Wales Dock. This provision permits the future connection of the utilities distribution networks for electrical power and other utilities supplies bringing greater flexibility and hence capacity availability for all parts of the site.
- 13.2.6 As new plots have been developed (see planning history in Chapter 2) new foul and surface water connections have been made. Surface water discharges primarily into the Prince of Wales Dock, although a number outfall to the River Tawe below the barrage has been installed.

- 13.2.7 The Eastside Energy sub-station on Fabian Way is now long established and provides the site with significant electrical capacity that Western Power Distribution have confirmed should be capable of delivering power for many years into the future. Together with the new electricity circuit around the Prince of Wales Dock, this sub-station provides the site with a robust solution.

13.3. Predicted Impact

- 13.3.1 The largest part of the utilities services infrastructure required to serve the completed development is already in place having been implemented with or in advance of the built development. The overall scale of infrastructure required to serve these parts of the site is therefore little different from that anticipated in 2010.
- 13.3.2 In all cases the strategy will be to continue to locate drainage and service routes below the road, cycle and footpath network thereby minimising the need for separate service corridors. To date pumping stations, sub-stations and the like have been accommodated within building plots. An energy centre will be established as part of the development upon the peninsula site. This will be integrated within the Teaching Building and the general strategy remains the same. It is not anticipated that the changes to the masterplan will give rise to the need to alter that strategy.
- 13.3.3 The Peninsula site is expecting to provide a localised district heating network served from the energy centre. This low carbon technology will make available heating to the future built environment as it develops. City & County of Swansea have also been developing a strategy for a city-wide district heating network. The Council's consultants have indicated that the SA1 site could be connected to the wider network at some point in the future creating further robustness in the solution.
- 13.3.4 The Peninsular site will have a shuttle bus which will operate to connect the proposed SA1 development to the wider public transport network. The shuttle bus would be able to turn on site at the existing turning head on the southern end of Kings Road, adjacent to the partially constructed Tidal Basin or the Revised SA1 Masterplan layout shows a loop with a possible bus gate feature crossing the Plaza. The new access road will also be used to access the residential and hotel developments at the southern end of the plot.
- 13.3.5 Marina Road is to be re-aligned to form a new junction with Langdon Road and create a more developable plot layout towards the north eastern end of Plot E.
- 13.3.6 All access roads should be constructed to a level no more than 0.3m below the T1000 flood level to allow emergency vehicular access in extreme flood events. $6.83\text{m} - 0.3\text{m} = 6.53\text{m}$ AOD.
- 13.3.7 Swept path analysis has been undertaken for a standard public service bus using the Peninsula site and the results can be seen in Appendices 6.1.

13.4. Mitigation

- 13.4.1 The construction of a new footbridge across the access to the Kings Dock will reduce journey times and enable pedestrians and cyclist to pass around the Prince of Wales Dock and link the southern end of Kings Road with Marina Road/Langdon Road.
- 13.4.2 The newly constructed footbridge will allow pedestrians and cyclists from the Peninsula site direct access to the proposed sports hall without having to circumnavigate the whole of the Prince of Wales Dock.
- 13.4.3 There is potential for small scale solar or wind generation on the development - this would require specialist advice with regards to viability.

13.5. Conclusion

- 13.5.1 No adverse effects are identified and the proposed revised masterplan broadly follows the previous masterplan from the 2010 AES and will have no major impact on the infrastructure for SA1.

14. Socio-Economic

14.1. Source data

- (1) Universities UK: "Submission to the 2013 Spending Round". May 2013
- (2) Universities UK: "The Impact of Universities on the UK economy". April 2014
- (3) BIS, HEFCE, HEFCW and others: "Higher Education – Business and Community Interaction Survey 2012-13. May 2014".
- (4) Higher Education Wales: "The economic impact of Higher Education in Wales". June 2013.
- (5) HEFCW: "Higher Education for the Nation". Jan 2015.
- (6) City and County of Swansea: "Swansea Economic Profile". February 2015.
- (7) Swansea Bay City Region Economic Regeneration Strategy 2013-2030

14.1.1 For the purposes of this assessment, UWTSD has collated information from various data sources in order to better understand the overall Economic Output of its activities. This Chapter is prepared in advance of the completion of this research: though is informed by a Draft Business Case prepared by DTZ dated December 2014. The information in this Chapter refers to source data and assumptions in relation to "adjusted" figures (compared to UK averages) for student spending and accommodation costs reflective of empirical data recorded by UWTSD. As such, the figures presented in this Chapter have the potential to change and will be shared with Welsh Government and the City and County of Swansea, as appropriate, and subject to the satisfactory completion of the research.

14.1.2 This chapter refers to July 2013 research published by the Department of Business Innovation and Skills for the academic year 2011/12. The research therefore relates to student expenditure in the academic year immediately preceding the introduction of a maximum annual student tuition fee of £9,000.00. In order to offer consistency, participation costs (which include tuition fees) for projected years exclude the recent increases. The total spending estimates are therefore considered conservative.

14.1.3 The increased revenue generated by UWTSD as a result of increased tuition fees will be captured in emerging and future UWTSD economic modelling.

14.2. Legislation

National

14.2.1 Planning Policy Wales (PPW Edition 7, July 2014) is the Welsh Government's principal statement of national policy and sets out the land use planning policies that should be taken into account by local planning authorities in Wales and may be material to decisions on individual planning applications.

14.2.2 PPW requires decisions on planning application to ensure that "social, economic and environmental issues are balanced and integrated" as part of a presumption in favour of sustainable development.

14.2.3 PPW supports a preference for the re-use of previously developed land and Paragraph 4.4.3 states that decisions and proposals should "promote access to employment, shopping, education, health, community, leisure and sports facilities and open and green space, maximising opportunities for community development and social welfare".

- 14.2.4 Paragraph 2.4.4 requires local planning authorities to make provision in their development plans for land for higher education and other community facilities.
- 14.2.5 Paragraph 4.6.2 refers to regeneration and identifies mixed use development “comprising appropriate combinations of housing (including affordable housing), employment, retailing, education, leisure and recreation uses and open space” as an effective way to achieve such aims through a process of integrating communities.
- 14.2.6 Technical Advice Note 23 (TAN23) Economic Development (2014) provides guidance for local planning authorities on developing high level economic planning objectives and assessing the economic benefits of new development.
- 14.2.7 The guidance notes that economic development should contribute to all dimensions of sustainability and where economic development would cause environmental or social harm which cannot be fully mitigated careful considerations of the economic benefit will be necessary. To weigh up the benefits and impacts LPAs are required to adopt a qualitative, criteria based approach.

Technical Advice Note 23: Economic Development (February 2014)

- 14.2.8 The main objectives of the TAN are to encourage new economic development opportunities wherever possible in appropriate locations, rather than to prevent or discourage it. Although the provision of employment space is encouraged within the TAN, it also warns against that the oversupply of land within an area.

Regional/National Benefits

- 14.2.9 The strategic benefit at a regional, or even national importance of economic development is recognised by TAN 23, Para. 1.2.1, stating:
- 14.2.10 ‘The economic benefits associated with development may be geographically spread out far beyond the area where the development is located. As a consequence it is essential that the planning system recognises, and gives due weight to, the economic benefits associated with new development.’

Economic Benefit and Sustainability / Environment

- 14.2.11 The balance between economic benefits and potential harm to the environment is an important consideration during the planning process. TAN 23 encourages local authorities and developers to think ‘positively and imaginatively’ and to seek a ‘win-win outcome’ where there is potential conflict between economic benefits of a proposal and possible social and environmental considerations. It is recognised at TAN 23, Paragraph 4.5.4 that in some cases the benefits of supplying employment land or development may outweigh the potential disadvantages/ adverse effects.
- 14.2.12 TAN23 identifies key questions to be considered when determining planning applications and allocations. These include the role of the proposal as being of “special Merit” – in essence, to what degree would the development make any special contribution to the policy objectives? Is the site a key element of a wider special strategy which aligns jobs, development and/ or infrastructure? Would the development bring ‘supply side benefits’ by raising skills and introducing innovation to the area?
- 14.2.13 For the reasons set out and amplified in this Chapter and throughout the Design and Development Framework Part 1 (The Planning Design and Access Statement), it is considered that the development proposal and masterplan is entirely consistent with the policy aspirations of TAN23 and the encouragement towards sustainable economic growth.

14.3. Local Planning Policy Context

- 14.3.1 The current development plan relevant to the determination of a planning application at the site is the Swansea Unitary Development Plan (UDP, adopted November 2008). The same development plan that was in place at the time of the 2010 application is therefore currently still the most relevant policy document.
- 14.3.2 The site is allocated as part of the SA1 Waterfront mixed use development area. The site is identified to provide 18 hectares of employment land (Policy EC1 (2)) and 1500 dwellings (Policy HC1 (21)).
- 14.3.3 The Draft Proposals Map (2014) identifies the site within Strategic Site J “Fabian Way Corridor”. The Draft Concept Masterplan focuses on developing the vacant sites between the two Universities (Swansea and UWTSD) with complementary uses that does not compete with the regeneration of Swansea City Centre. The Masterplan also seeks to create a new spine street that links Langdon Road to the main street of the Bay Campus. This opens up the intervening vacant sites for complementary uses that are urban in scale and active in nature.
- 14.3.4 Policy EC2 of the UDP is considered to be the policy of most relevant to the revised development framework. This states that:
- “A major redevelopment area is identified at SA1 Swansea Waterfront for mixed employment and residential development together with supporting leisure, tourism, community uses and ancillary services. The development of the site should:*
- (1) Be comprehensive,
 - (2) Integrate with the Maritime Quarter,
 - (3) Complement and not compete with the City Centre,
 - (4) Be of a high standard of design,
 - (5) Embrace principles of sustainable development,
 - (6) Provide high quality employment opportunities,
 - (7) Increase the range of housing choice,
 - (8) Make appropriate provision for a network of pedestrian and cycle routes, and
 - (9) Safeguard the potential canal route corridor”.
- 14.3.5 Although the policy makes no explicit reference to education facilities, the 2010 planning permission reduced the amount of institutional/education floor space (compared to the original proposals) and therefore the 2015 revised development framework will reverse this trend.
- 14.3.6 Planning policy supports a range of employment uses on the site and therefore ancillary R&D and office development are likely to be supported in principle subject to their impact on uses previously proposed.
- 14.3.7 The site is also partly located within a hazardous installation consultation zone with Policy EV41 referring to not permitting development if there would be a significant health risk. The extant planning permission for the site is such that this issue is considered to have been resolved.
- 14.3.8 Once adopted the Swansea Local Development Plan will replace policies in the UDP. The Preferred Strategy (July 2014) sets out the broad approach that the LDP intends to take in order to ensure that the County is developed in a sustainable manner. The LDP is expected to be adopted in December 2016.

14.3.9 Referring to SA1, the Preferred Strategy states

“Further investment at SA1 Swansea Waterfront is needed in order to continue successful regeneration of the former dock area, whilst complementing the aims for City Centre regeneration”.

- 14.3.10 SA1 is also referenced in relation to employment opportunities and the Preferred Strategy notes that a cross boundary masterplan extending from SA1 through Swansea Port to the campus (Swansea University) and beyond is being prepared alongside the LDP.
- 14.3.11 The Preferred Strategy refers to SA1 as part of the ‘Urban Waterfront’ which is described as the “areas adjacent to the River Tawe and Swansea Bay within the main urban area of the County, including sites at the Tawe River corridor, SA1 Swansea Waterfront, Swansea Marina, and others adjoining Swansea Bay up to and including Mumbles”.
- 14.3.12 This combined area is referenced in respect to tourist facilities and paragraph 7.54 seeks development in the area to consider how they can maximise the benefits presented by other established waterfront developments already providing attractions and commercial operations for residents and visitors.
- 14.3.13 The urban waterfront is considered to be an ideal location to develop the city’s cultural and leisure facilities, offering attractions and facilities and increase levels of ‘City Break’ tourism.
- 14.3.14 The University has been in regular liaison with the City and County of Swansea since before the masterplanning commission was awarded to the consultant team. This liaison has continued during the preparatory and strategic options stages, with progress reports held covering issues including, but not limited to, the masterplan, technical assessments and quantum of development. The City and County has been made aware of the commercialisation strategy (Section 3.5 of the Planning Design and Access Statement and the desire to attract inward investment as a means to help deliver lasting positive planning and economic impacts for the City Bay region.
- 14.3.15 The Swansea City Centre: Strategic Framework Review’ (Consultation Draft January 2015) seeks to provide an up to date guidance to facilitate future development and investment, and provide a robust evidence base and sound principles on which to plan future regeneration.
- 14.3.16 The document refers to the ambitious, strong, integrated and coherent city centre capable of supporting city region status and delivering a 24 hour economy, with the city striving to become ‘an exemplar for how it approaches post-recession, mixed use, city centre regeneration’. The Review identifies a need for a:
- ‘vibrant mix of leisure, culture, retail, office and residential uses all delivered in a legible way with high quality buildings alongside public spaces which exhibit and celebrate the culture which differentiates Swansea from other cities’.*
- 14.3.17 SA1 is identified as one of a number of areas that have a ‘close relationship’ to the city centre and reference is made to SA1 becoming the ‘Innovation Quarter’ of University of Wales Trinity Saint Davids. Section 2.4 notes: ‘the SA1 area that is within walking distance of the City Centre had the potential to compete with the regeneration aspirations due to the significant quantum of leisure development that was approved as part of the masterplan for the former dock area. However the change in focus of SA1 to accommodate the ‘innovation campus’ of University of Wales Trinity St Davids and the re-masterplanning of the area will complement the City Centre through the mix of uses and will remove the potential for large scale leisure development’.
- 14.3.18 The Review therefore provides evidence to support an alternative use on the former ‘leisure quarter’ in terms of uses “diverted from the city centre” as referenced in Paragraph 5.20 of the Port Tawe & Swansea Docks SPG.

14.3.19 The document also recognises the importance of the Maritime Quarter/ and Sail Bridge as a key area connecting the city to the waterfront.

14.3.20 The positive economic impact generated by the Masterplan proposals demonstrates the importance of the site and the opportunity to stimulate economic activity and maximise the use of the waterfront as a commercial and community asset. The masterplan proposals are therefore considered in accordance with the economic policy objectives set out in the City Centre Review (Jan 2015).

14.4. The economic impact generated by the Higher Education Sector (UK)

14.4.1 In relation to economic performance, an impact model has been developed by the Universities UK (UUK) to calculate two key outputs:

1. The £million expenditure generated throughout the UK due to activity of individual Higher Education institutions; and
2. The full time equivalent (FTE) jobs created throughout the UK due to the activity of individual Higher Education Institutions.

14.4.2 References to total economic output and job generation is set out in the following overview generated from a range of information sources.

14.4.3 Research by the University of Birmingham (Oxford Economics April 2013) presents a very concise and informative summary of the economic impact of the university as an entity. In summary, the research states:

“A university holds a prominent role in its community. Its students and staff frequent local businesses and add to the diversity of the area: they act as informal ambassadors raising the overseas profile of the university and area; they can support and sustain community groups through volunteering; and, having graduated, they may add to their newly-acquired skills to the local labour market. The university (as an organisation) is a major employer, both through the people it directly employs and those whose employment is supported through its purchase of goods and services; the university can encourage students from families with little experience of higher education to continue their studies; and, the research conducted at the university can have far reaching benefits for society as a whole.”

14.4.4 Research undertaken by Universities UK published in July 2010 (“Making an economic impact: Higher education and the English regions” provides a contextual summary of the importance placed upon Higher Education Institutions as a catalyst to economic growth. The report states:

“The role of higher education in the economy is attracting growing attention in all developed countries. In particular its potential contribution to economic prosperity, through innovation and knowledge exchange to the wider society, is regarded as vitally important for economic development and growth. At a time of global economic crisis governments across the world are looking to their universities to support national and regional economies, through the development of new ideas, products and services from research as well as through continuing to raise citizens’ levels of education and increase the national capacity to innovate and adapt.

14.4.5 In the UK it is increasingly recognised that the higher education sector forms a core part of the economic infrastructure, generating employment and output, attracting export earnings and contributing to the gross domestic product (GDP). The sector has become all the more important in a severe recession when other sectors of the economy are contracting.

- 14.4.6 The report confirms the substantial effect of higher education activity on employment, with universities creating many jobs in their regions and across the UK. The report provides further evidence of the importance of international students to the sector and the wider economy. One significant regional impact highlighted in the report is the volume of personal off-campus expenditure of these students and their visitors”.
- 14.4.7 While it is accepted that the sources referred to within the Chapter include English research and experiences, the substantive evidence demonstrating the relationship between the HE sector and economic activity and output is considered equally applicable to a Welsh context.
- 14.4.8 Latest published research undertaken by the Higher Education Funding Council for England (HEFCE) (“Annual Higher Education – Business and Community Interaction (HE-BCI) Survey 2012/13: Dated May 2014”) concluded that:
- “Data collected for the academic year 2012/13 show a continuing increase in the exchange of knowledge between UK Higher Education Institutions (HEI’s) and the public, private and third sectors.”*
- 14.4.9 Universities in the UK contributed £3.57billion to the economy in 2012/13 through services to business, including commercialisation of new knowledge, delivery and professional training and consultancy. This was up 5% on the previous academic year.
- 14.4.10 The report concludes:
- “At a time of economic difficulty, growth in knowledge exchange income and activity provides an excellent case for continued public investment in higher education and specifically in knowledge exchange funding streams. During 2013 the UK economy showed signs of recovery and an emergence from the recession which began in 2008, although overall gross domestic product (GDP) remained below pre-recession levels (HE-BCI growth was greater than overall UK GDP growth).”*
- 14.4.11 Analysis shows that large businesses increased investment by 11% from £660m to £729m in 2012/13, while investment from public and third sectors partners grew slightly, by 1.8% from £1.271m in 2011/12 to £1.294m. SME investment declined by 1.1% from £183m to £181m across the UK. Overall the data show that knowledge exchange activity from the UK higher education sector is holding up well, with increases across most indicators and an increase in total income of 5% (see above).
- 14.4.12 Published in June 2015, the latest Universities UK research paper “The Economic Role of UK Universities” re-iterates the conclusions of previous studies referred to above. In summary, the latest 2015 paper, referring to analysis of 2011-12, concludes that UK Universities:
- a) Generated over £73bn of output (direct, secondary and multiplier)
 - b) Directly employed 378,250 people, and a further 373,794 full time equivalent (FTE) jobs in other sectors of the economy were dependent on expenditure of universities
 - c) For every £1m of University output, a further £1.35m of output was generated elsewhere in the economy: in Gross Added Value (GVA) terms, every £1m of University GVA was associated with the generation of a further £1.03m in other UK industries.
- 14.4.13 In relation to Universities as innovation facilitators / brokers, the 2015 paper concludes that:
- “Aside from contributing to business innovation directly by collaborating on the development of new products or services, universities also play an important role in facilitating innovation indirectly. For example, they provide space for innovative firms to interact closely and assist in the development of networks.*

Interestingly, Universities are investing in spaces, equipment and facilities that are open to, or shared with, the local innovation community. This is an effective way for them to accommodate the needs of the local innovation community and help maintain the world-class facilities that are needed to attract talent and investment from other parts of the UK and the world.”

“Universities, thanks to their scale, networks and reputation, can do a lot to attract major investors. They are particularly good at attracting the sort of knowledge intensive businesses that are needed to rebalance the UK economy towards high-value-added sectors and tend to grow quickly and create high-quality jobs in their region.

Encouraging high-growth business clusters is an effective means of promoting economic growth. An extensive body of research recognises the business agglomeration (or cluster) effects act as catalysts for rapid growth in knowledge based economies”.

- 14.4.14 The SA1 development is specifically geared towards enhancing a mixed use business quarter with the University at its heart. This is in line with the commercialisation strategy set out in Part 1 of the Design and Development Framework: Planning Design and Access Statement which accompanies this Environmental Statement Addendum in support of the variation of condition application.

14.5. The economic impact generated by the Higher Education Sector (Wales)

- 14.5.1 In the Welsh context, the latest research undertaken by Higher Education Wales (June 2013) shows

“that while the HE sector is of considerable importance to Wales in supporting economic development through education and research, it is also a major economic actor and industry in itself, generating output, jobs and gross value added (GVA), supporting communities across Wales. The results clearly demonstrate that, irrespective of any wider impact generated by the nature of higher education activities, higher education institutional expenditure and that of higher education staff and students have an immediate positive impact and this impact is significant for Wales, with spillover benefits for other parts of the UK.”

- 14.5.2 Analysis showed that Welsh university expenditure, together with the expenditure of university staff and students generates economic activity through secondary or “knock-on” effects. In 2011/12 the Higher Education Statistics Agency data shows a total (Welsh) expenditure (including staff salaries) of £1.28bn. However, this expenditure was calculated to generate a further £1.76bn in other industries throughout the UK, with the majority (£1.31bn) accruing in Welsh industries.

- 14.5.3 In relation to student profile, the report concluded that:

“The HE sector provided extensive educational opportunities for Welsh Students, with 10 HEI’s across Wales. There were 66,920 Welsh-domiciled students registered at the Universities in 2011/12 and the opportunities provided by the universities meant that these students did not have to go to other parts of the UK, or abroad, to study. In that sense, the Welsh higher education played an important role in retaining Welsh students within Wales. This is important, of course, in terms of increasing the national skill base and the absorptive capacity of Wales.

It also means that a large proportion of student spending was retained within Wales. Welsh domiciled students spend an estimated £517m in personal and living expenses. Attracting students to, and retaining students within, the region is important for local and regional economic development.”

- 14.5.4 Of the 4,741 students enrolled with the University and based at Swansea campuses in the current academic year, 3,917 (82.6%) are Welsh domiciles.
- 14.5.5 In the context of employment, the report concluded that the HE sector in Wales directly employed in the order of 16,250 FTE's in 2011/12, generating activities to support a further c17,500 jobs around the UK, of which c13,600 were within Wales. The total combined impact (taking into account international students, Welsh domiciled students and 'rest of the UK' student expenditure), the total number of jobs created increases to c43,300 job across the UK, of which c38,800 are within Wales.

14.6. Local Economic Profile

- 14.6.1 Recent data provided by the City and County of Swansea (February 2015), see overleaf, provides an overview of Swansea's labour market and economy. A summary of the key findings, demonstrating the comparative performance between Swansea, Wales and UK is set out overleaf.
- 14.6.2 The research suggests that economic activity and employment rates in Swansea are below the Wales average and equivalent UK rates. However, it is considered that the proportionally high number of students within the City has some effect on these figures.
- 14.6.3 The economic profile assessed the Gross Value Added (GVA) output of Swansea at £17,225 (per head), higher than the Welsh average (£16,893 for the same period). Weekly earnings, at £504.80 were above the Welsh average (at £479.40).
- 14.6.4 In headline terms, Swansea's total GVA was worth £4.193bn. This was a notable contribution to the overall Welsh GVA of £52.0bn. GVA is calculated on a workplace basis and so does not include the income generated by Swansea residents who commute and work outside the City. Swansea's GVA per head (see above) is the second highest of the sub-regional areas within "Wales West and Valleys", but below that of the sub-regional areas in East Wales.
- 14.6.5 Swansea was highlighted as the 343rd most competitive locality in the UK in terms of economic performance (from 379 locations). (Source: UK Competitiveness Index 2013).

14.7. Baseline Position: Students, Jobs, Productivity and Economic Growth

- 14.7.1 In the academic year 2014/15 3,851 students (3,481 FTE) are recorded as studying at UWTSD in Swansea, supported by 2,200 members of University staff across all campuses. Of the 3,851 students, 766 come from Communities First areas.
- 14.7.2 Tuition fees and education contracts income were responsible for 44% of (£47.8m) of the UWTSD's total income in 2014. In 2014, UWTSD reported 51 graduate start-ups from across its campuses.

Table 14. 1: Swansea Economic Profile (May 2015)

City & County of Swansea – Information, Research and GIS Team
SWANSEA ECONOMIC PROFILE: MAY 2015

This profile provides a statistical overview of Swansea's labour market and economy, bringing together recent published data from a variety of official sources. It selects the key data sets available at local authority level, and suggests how Swansea compares with the wider picture.

The information, which is updated on a regular basis as new data becomes available, aims to assist in presenting an overall picture of the structure and performance of the local economy. The report also outlines recent trends, where appropriate, generally over the latest available twelve-month period.

The table below provides a summary of the key indicators used in the profile; namely the most recent values for Swansea, Wales and nationally (UK or England & Wales, depending on the dataset), the values indexed against a national average (where applicable), and the latest annual percentage change. The indicators are explored in more detail over the following pages.

<i>Indicator</i>	<i>Area</i>	<i>Latest value</i>	<i>Index (national=100)</i>	<i>annual % change</i>
Economic Activity Rate (working age, period to Dec-14)	Swansea	74.4%	96	+4.1%
	Wales	74.7%	97	-0.5%
	UK	77.2%	100	+0.3%
Employment Rate (working age, period to Dec-14)	Swansea	68.5%	95	+5.8%
	Wales	69.5%	96	+0.8%
	UK	72.2%	100	+1.7%
Employment (workplace estimates, 2013)	Swansea	106,000	n/a	+3.3%
	Wales	1,274,600		+0.5%
	UK	28,297,300		+1.4%
Unemployment Rate (claimants, unadjusted, Mar-15)	Swansea	2.4%	120	-25.3%
	Wales	2.5%	125	-26.2%
	UK	2.0%	100	-30.9%
Business stocks (2013)	Swansea	6,335	n/a	+1.7%
	Wales	89,750		+2.0%
	UK	2,448,745		+3.2%
GVA (Gross Value Added) per head (2013)	Swansea	£17,445	75	+5.7%
	Wales	£16,893	72	+3.4%
	UK	£23,755	100	+2.5%
GDHI (Gross Disposable Household Income) per head (2012)	Swansea	£14,105	84	+3.7%
	Wales	£14,623	87	+3.8%
	UK	£16,791	100	+3.3%
Earnings (full-time gross weekly, 2014)	Swansea	£504.80	97	+5.7%
	Wales	£479.40	93	+0.9%
	UK	£518.00	100	+0.1%
House prices (average sale price, Mar-15)	Swansea	£110,247	62	+4.8%
	Wales	£117,828	66	+2.7%
	Eng & Wal.	£178,007	100	+5.3%
Housing transactions (quarter ending Dec-14)	Swansea	816	n/a	-3.4%
	Wales	10,935		-2.4%
	Eng & Wal.	231,191		-3.3%

Notes:

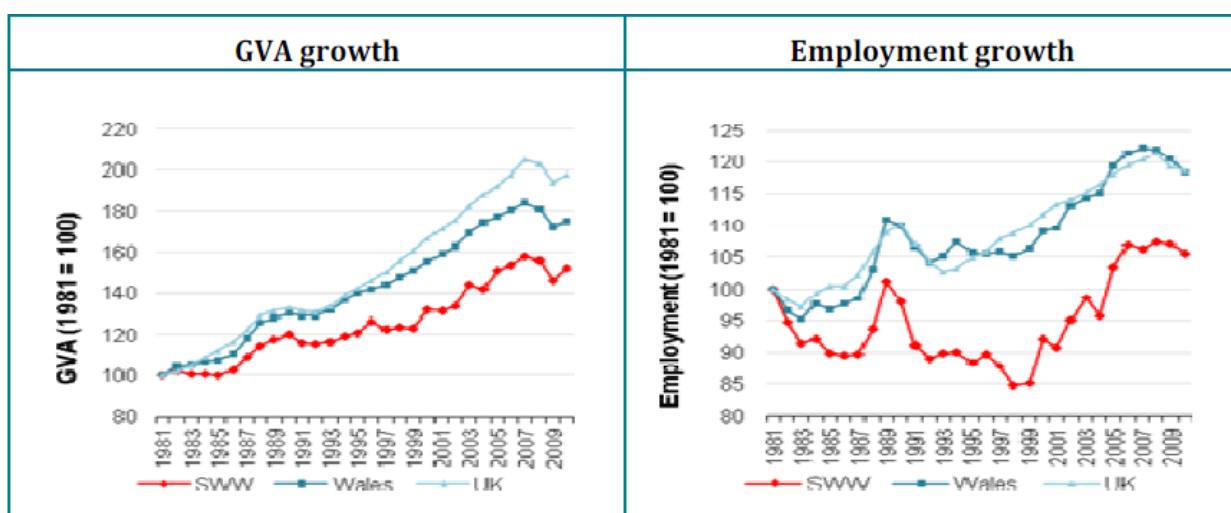
- i. The 'annual % change' figures for Economic Activity Rate, Employment Rate and Unemployment Rate refer to change in the numbers of economically active, employed and claimant unemployed over the period, rather than changes in the rates themselves.
- ii. As the local and national workplace employment, business stocks and housing transactions figures are not directly comparable, index values (where national=100) are not provided.

- 14.7.3 UWTSD has placed innovation, enterprise and knowledge transfer at the heart of its new Strategic Plan. The University has valuable resources for driving innovation in the region in terms of the specialist knowledge of its staff/students and the wide range of specialist equipment it can make available to businesses. In this context, it is noted that 51 graduate start-ups were generated across the Campuses in 2014.
- 14.7.4 The distinctive aspect of the University's business engagement work is that it focuses on near to market problems / issues experienced by local businesses, and particularly SMEs. Assistance is therefore based on finding solutions rather than research. This is a key strength of the University and a differentiator from the more large-scale, academic research undertaken at Swansea University.
- 14.7.5 The current estate and profile of UWTSD in Swansea is a constraint on its ability and capacity to engage fully with local businesses because:
- It is 'hidden' away in fragmented locations across the City. It does not have high visibility and profile with the regional business community
 - It does not convey a dynamic 'open for business' image and culture. The University is fragmented, some of its buildings are tired and old-fashioned and it is not easily accessible
 - The current buildings are not suited to the co-location of academics and businesses – which would transform the innovation ecosystem in the University.
- 14.7.6 The SA1 development will connect UWTSD more closely with the business community through the co-location opportunities that will be created and the increased proximity of the University to businesses including those in the two Techniums.

Supporting Growth in the Regional Economy

- 14.7.7 South West Wales has lagged behind Wales and the UK in creating wealth and jobs over the last three decades, as illustrated in the diagram below

Table 14.2: GVA and Employment Growth 1981-2010 South West Wales (SWW), Wales and UK



Source: Swansea Bay City Region Economic Regeneration Strategy 2013-2030

- 14.7.8 The reasons for this are summarised as follows:
- A significant productivity gap between the South West Wales and Wales/UK.

GVA per employee in South West Wales in 2010 was 77% of the UK average – by contrast it was 90% of the UK average in 1990. Clearly external factors are at play with UK growth driven by the performance of London as a global city and the wider South East region. However, productivity growth in South West Wales is also lower than for Wales as a whole. This productivity deficit is not because workers in South West Wales work less hard than their counterparts elsewhere. Indeed, the average hours worked are similar. The two key factors which drive this under-performance are: the sectoral mix of the economy which is geared towards lower value sectors; and the types of jobs on offer within these sectors which tend to be lower value than elsewhere. Only in Government Services, where the presence of Head Quarters is a factor, is productivity higher in the Swansea Bay City Region than the UK.

- Too few jobs.

Following the 1990/91 recession it took South West Wales over a decade to recover the jobs that were lost, with employment growth lagging behind the UK and Wales. The forecasts in the Swansea Bay City Region Economic Regeneration Strategy 2013-2030 suggest that without concerted action this trend could be repeated for the 2007/08 recession with employment levels in South West Wales not expected to return to their level in 2010 until at least 2028.

- Too few businesses and start-ups.

South West Wales has fewer businesses per head of the population than the UK and considerably fewer businesses are started in South West Wales (on a per capita basis) than in Wales and the UK (in 2010, 37 new businesses started per 10,000 of the working age population compared to 58 in the UK and 59 in Wales).

- Insufficient people with higher level qualifications.

Increasingly as the country competes on the basis of knowledge and quality, the skills of the workforce are a key determinant of economic success. South West Wales under performs in this area with only 28% of residents having degree level qualifications compared to 33% across the UK.

14.7.9 DTZ consider that the economic case for investment in the SA1 Waterfront Innovation Quarter is strong. The development will help to address many of the factors that have constrained growth in South West Wales in the past. It will contribute to:

- Closing the productivity and employment gap with Wales and the UK.

The SA1 campus development will provide improved accommodation and facilities for key UWTSD Academic Schools that are instrumental in supporting innovation and knowledge based economic growth. For example, the Faculty of Applied Design and Engineering which provides near to market design, development and testing services for local SMEs, will be at the heart of the campus. This location will give it greater proximity to businesses, especially in the SA1 Techniums. It will also increase its visibility and profile in the business community which will help to promote more university – business collaboration.

- Closing the enterprise gap with Wales and the UK.

An integral part of the SA1 development will be to nurture more graduate spin out companies in the future (an area where UWTSD already has a good track record) through the network of embedded innovation hubs that will be established in the new academic buildings at SA1. The vision is to provide a supportive environment for students / graduates / staff to develop new businesses. The embedded nature of the innovation hubs means university entrepreneurs would have access to facilities, equipment and staff in the University. This could also be available to entrepreneurs and SMEs outside the University, and particularly to the SMEs in the SA1 Techniums.

- Closing the skills gap with Wales and the UK.

UWTSD has a crucial role to play in this respect because over half its students are from the local area and it has a track record of recruiting from non traditional backgrounds. It also offers programmes which make it easier for working people to engage in higher education. Workforce HE skills development is as important, if not more important, than traditional HE provision in closing the skills gap in South West Wales. For example, UWTSD runs a number of Degree-level Engineering Programmes from 1-7pm on a Friday over 42 weeks. Typically new entrants already have a HND but want to take the next step and obtain a Degree. The programme enables them to achieve this in 2.5 years with minimum time away from work. These programmes are popular and provision of this kind is a key way in which UWTSD can contribute to regional economic development. A location in SA1 will increase the visibility and profile of the University in the community and help to make workforce training more accessible.

14.8. Student Numbers

- 14.8.1 In the current academic year (2014/15), UWTSD has confirmed that the FTE student cohort based across the Swansea sites is 3,481 FTE.
- 14.8.2 In the future opening year of the UWTSD SA1 Waterfront Innovation Quarter, it is projected that c3,900 FTE students will be enrolled with the University in Swansea, with c3,400 FTE based at SA1: the residual being based at the Cultural Quarter (Art and Design) and/or at the Ty Bryn Glas site (Business School).
- 14.8.3 As referenced in the Transport Assessment and Framework Travel Plan, the University will undertake annual student and staff monitoring in order to inform the degree to which sustainable transport measures are being appropriately implemented.
- 14.8.4 The projected staff cohort using the SA1 Waterfront Innovation Quarter Higher Education facilities is estimated to be c580 FTE.
- 14.8.5 These are the baseline assessment figures used throughout this Chapter.

14.9. Destination of leavers (Higher Education) Survey

- 14.9.1 Undertaken in the summer of 2014, relating to graduates who completed their studies in 2012/13, the final response rate from students obtaining a first degree from full time courses at UWTSD was 83.4%. The percentage of these students in employment or further study was 91.1%, compared with 88% in the UK.

14.10. Research and Publications

- 14.10.1 In relation to the market penetration or awareness of UWTSD activities, the following research performance ratings demonstrate that the University is able to demonstrate a broad and high quality range of courses, attracting national and international students and research funding to promote its ongoing academic endeavour. The information below relates to the key areas of university operations in the year 2013/14.

Art and Design

- Ranked overall: 32nd in Art and Design in the UK
- 95.8% of the research is world leading, internationally excellent or recognised
- 75% of research was classified as world leading or internationally excellent.
- 50% of WIRAD's research was judged to have outstanding impact and 50% deemed to have very considerable impact.
- 40% of the research environment was world leading in terms of its quality, vitality and sustainability; 60% was internationally excellent

Geography, Environmental Studies and Archaeology:

- 14% of research outputs were deemed to be world leading
- 32% recognised as internationally excellent
- 37% is internationally recognised
- 20% was recognised for its impact as being very considerable and a further 50% was considerable.

Celtic Studies:

- 26% of the research is recognised as world leading and 39% is recognised as internationally excellent.
- 40% of research was judged as being outstanding in terms of impact and 50% very considerable
- 70% of the research environment scored the highest possible rating in terms of supporting research of world leading quality.

Classics:

- 38% of research is internationally excellent with 4% deemed to be world leading
- 50% of research is recognised as very considerable in terms of its impact confirming the School's innovative approach to the subject as a modern and engaging discipline
- 70% of its research environment is recognised for supporting research of international standards with 20% of that being internationally excellent.

Theology and Religious Studies:

- 50% of research is outstanding and 50% is very considerable in terms of its impact, demonstrating the School's innovative approach to their areas of study
- 62% of research is internationally excellent or better with 14% of that being world leading
- 50% research publications were internationally excellent with 5% of that being world leading
- Ranked 2nd overall in the Cathedrals Group of Universities.

General Engineering:

- 69% of the research was recognised as being of a quality that is recognised internationally for originality, significance and rigour.
- 89% of research outputs were rated internationally for originality, significance and rigour.
- 40% of the research was judged to have considerable impact demonstrating the University's strong track-record of collaboration with industry.

14.11. Business Partnerships and Collaborative working

- 14.11.1 The University looks to maximise its impact on the regional (and by implication the national) economy through its vocational courses, the “employability” of its graduates and its collaboration with enterprise (see Commercialisation Strategy in Section 3.5 of the Planning Design and Access Statement). The University has over a period of years developed significant strengths in areas that are high on the agenda of business and society and that can lead to employment, wealth creation and an improved quality of life.

- 14.11.2 The University seeks to exploit these assets and use them to build an innovation and knowledge transfer network that can generate and encourage the flow of ideas between the University and business. This leads to the formation of “spin-in” and “spin-out” companies, intellectual property and trained and inspired young scientists, entrepreneurs and practitioners.
- 14.11.3 The University’s objective is to provide commercial and societal benefits to the region whilst strengthening its long-term position as a major Higher Education Institution within Wales. This strategy envisages a collection of applied academic centres / research labs, feeding into incubation centres for companies who are supported by the University’s expertise and culture. The University supports the development of Technology Innovation Centres, with established businesses and start-ups companies, and supplemented by a post graduate centre that positively encourages interaction between researchers and business.
- 14.11.4 UWTSD has and continues to develop constructive working relationships, partnerships and collaborative ventures, including research with a range of local South and West Wales based companies and multi-nationals. In the current academic year, the University is working with, or has recently completed projects with the following:

Table 14.4: Local Business Partnerships

- Regional Learning Partnership
- Swansea Business Improvement District (BID)
- SW Wales Regional Hub (Enterprise)
- Swansea Skills Group
- Arts in Health
- Stain glass advisor to the diocese of St Davids
- Stain glass advisor to the diocese Swansea and Brecon
- Stain glass advisor to the Cathedrals and Churches Commission of the church in Wales
- Bisnet
- Swansea Business Club
- Building Enterprise Education in Swansea (BEES)
- Enterprise Support Programme (ESP)
- South Wales Chamber of Commerce

14.12. Student Housing Provision

- 14.12.1 Of the University’s current 67,000m² floorspace at Swansea, 7,500m² is student residential accommodation. UWTSD has 317 student accommodation units in Swansea. Details of the residential accommodation are provided below. UWTSD Swansea has five halls of residence based on two separate campuses. There are over 317 rooms for first year students to apply for with a mixture of standard study bedrooms and rooms with en-suite facilities. This equates to some 7.8% of the total number of students enrolled with the University in Swansea.
- 14.12.2 Accommodation prices range from £63.00 to £80.00 per week. All utilities are included as well as wireless internet access. The contract length runs for the full academic year from September until June. Details are provided below.

Hall of residence	Room type	Beds	Weekly rent	Licence length	Annual rent
Mount Pleasant	En-suite	37	£80	38 weeks	£3,040
Mount Pleasant	Twin (en-suite)	12	£63	38 weeks	£2,394
Townhill - Cenydd	Single	108	£63	38 weeks	£2,394
Townhill – Dyfed	Mixed	90	£63	38 weeks	£2,394
Townhill – Gwyr	En-suite	60	£69	38 weeks	£2,622
Townhill – PGCE flats	Mixed	10	£69 - £80	42 weeks	£2,898 - £3,360
Total		317			

Source: UWTSO

14.12.3 In comparison, the private sector rents in Swansea in 2013 can be seen below:

	Units of Accommodation within sample	Average Rent	Rent at Median (Q2)	Rent at Lower Quartile (Q1)	Rent at Upper Quartile (Q3)
	a	b	c	d	e
Room in shared house	1,271	£270.11	£268.67	£250.00	£285.00
Studios	..	..	..	..	..
1 Bedroom Accommodation	620	£488.29	£475.00	£400.00	£550.00
2 Bedroom Accommodation	1,177	£561.12	£500.00	£450.00	£640.00
3 Bedroom Accommodation	814	£570.79	£550.00	£495.00	£600.00
4 Bedroom Accommodation	197	£815.11	£750.00	£650.00	£950.00

Source: StatsWales

14.12.4 The average weekly rent of a room in a shared house in Swansea in 2013 was £63; this is equal to the lowest accommodation charge in Swansea, however it is understood that many landlords charge throughout the year and therefore annual charges to students are higher (based upon a 52 week period, rather than 38 or 42 week rental period on-campus. The annual charge for students living in the private rental market is therefore considered to be in the order of £3,275.00 (excluding utility bills) compared to accommodation costs for resident first year students which start at £2,394.00 (including utility bills) for the academic year. Average annual rent for on-campus UWTSO accommodation is currently £2,536.00 (£804,000 divided by 317 students).

- 14.12.5 In the current base year (2015) UWTSD data has confirmed that c1% (37) of Swansea students are recorded as living at home. Taking account of the 317 students resident on site, of the c3,127 residual students studying in Swansea, it is reasonable to assume that the vast majority reside in privately managed accommodation, and that there is a higher propensity for these students to reside within a reasonable commuting distance of the three campus locations. This would be reflective of the general distribution of student areas across the City.
- 14.12.6 The 317 students living on site currently generate a (conservative) accommodation income of c£804,000 per annum to UWTSD. Assuming an average annual private rented accommodation cost of c£3,275.00 applied to the estimated 3,127 Swansea based UWTSD students living off-site and in rented accommodation generated a total annual income of approximately £10.24m to private landlords (these being both individuals and registered companies). This excludes all living costs, the majority of which is estimated to be expended in the City.
- 14.12.7 Given that the masterplan proposals and academic service delivery do not directly or materially affect students based in Carmarthen or Lampeter, we have excluded statistical and/or expenditure impacts from this assessment. Where total output is cited, this will include all student and staff activity, irrespective of their campus location across the University's estate.

14.13. Masterplan proposals: Student accommodation

- 14.13.1 The future of the student residential accommodation blocks owned by the University and located at Townhill (268 units) and Mount Pleasant (49 units) requires detailed consideration, and the University will need to actively plan for an appropriate outcome – as the provision of accommodation is a crucial part of the student offer. The University does not consider that its existing halls of residence represent a desired long term option due to their condition and the fact that they will be further away from the main academic activity at SA1 and may be subject to disposal to fund the new Campus.
- 14.13.2 A detailed assessment of the options and the supply-demand dynamics has been undertaken and 2 options have emerged:
- (1) University to promote and market the development of student accommodation at SA1 through a Public Private Partnership and/or through a sale and lease back with a nomination agreement.
 - (2) University to remove student accommodation (as a use class) from the developing masterplan at SA1 and instead allow the market to evolve to meet the demand for accommodation
- 14.13.3 The University's current view is that there are other providers who can meet any additional student residential demand that arises in the future, rather than getting directly involved in developing and managing accommodation.

14.14. Student Expenditure

- 14.14.1 The 2011/12 Student Income and Expenditure Survey (SIES) was jointly commissioned by the Department for Business, Innovation and Skills (BIS) and the Welsh Government. The study was conducted in partnership by the National Centre for Social Research (NatCen) and the Institute for Employment Studies (IES). This report presents the findings for students from England. A separate report covers students from Wales. The aim of the survey was to provide an authoritative report on the financial position of HE students in England and Wales in the academic year 2011/12, and provide a baseline against which to measure changes to the student financial support package from 2012/13.

- 14.14.2 The Institute for Employment Studies (IES) is an independent, apolitical, international centre of research and consultancy in public employment policy and organisational human resource issues. It works closely with employers in the manufacturing, service and public sectors, government departments, agencies, and professional and employee bodies.
- 14.14.3 The survey highlights that an average annual student expenditure of a full time student is £13,909.00. The average annual housing costs incurred by full time students in the UK is £3,628.00. This compares with an estimated average Swansea private rented market figure of £3,275.00 and an average on-campus accommodation cost at UWTSD of c£2,536.00.
- 14.14.4 Given the small on-site provision of student accommodation for UWTSD students in its Swansea estate, and the reduced costs of accommodation when compared with the private market (the majority of students being housed in private rented accommodation), it was not considered appropriate to apply on-campus costs to all students. As confirmed at Section 14.13 above, the University does not currently wish to provide bespoke student accommodation within its development plots at SA1 and would prefer the market to deliver student housing to meet local needs.
- 14.14.5 For the purposes of this assessment, it was not considered appropriate to maintain the BIS UK average spending figure while increasing housing costs to reflect the actual situation at UWTSD. This would have resulted in a far lower than average annual living cost spend for each UWTSD student compared to the UK average.
- 14.14.6 As such, to maintain the annual living cost for UWTSD students, the estimates are based on the UK average living costs (£6,308.00), with total spend reduced to reflect regional estimated accommodation costs.
- 14.14.7 The BIS survey relates to the academic year 2011/12 and therefore prior to the introduction of increased student tuition fees. Average annual participation costs for a full time student was recorded as £3,973.00: this will have increased in recent academic years, however that spend would be received by the Universities and will be reported as part of any direct university economic output modelling over time.
- 14.14.8 Extracting the BIS data, Table 14.7 (below) estimates that Swansea based UWTSD students spend in the order of £46.948m annually of which £0.804m was generated by UWTSD for on-campus accommodation costs and £10.240m going to private landlords across the City. This figure includes an allowance for 1% (total) of students not recording housing costs in the year: the majority of whom are assumed to live at home and incur no accommodation costs.

Table 14.7: Estimated Current (2014/15) Student Expenditure (incorporating UWTSD adjustments) 2015

Estimated Student Expenditure Profile (Economic Output): UWTSD (2014/15 current Swansea based students): 2014/15 prices				
Description	Ref	UK average	UWTSD Adjusted	Source
		(1)	(2)	
Average Annual Total Spending per Student	a	£ 13,909.00	£ 13,487.00	BIS SIES June 2013
Average Annual University participation costs (including Tuition Fees 2012/13)	b	£ 3,973.00	£ 3,973.00	BIS SIES June 2013
Average Annual Housing Costs	c	£ 3,628.00		BIS SIES June 2013
Average private rented accommodation in Swansea (rounded)	c(2)		£ 3,275.00	UWTSD 2015
Average Annual Housing Costs (UWTSD Adjusted, reflecting on-campus acc costs) (rounded)	d		£ 3,206.00	UWTSD average accommodation costs (private rented average plus on-campus average, blended)
Extracted accommodation costs (on-campus only)	d(2)		£ 2,536.00	UWTSD 2015
Living Costs (excluding Tuition and Housing Costs)	e	£ 6,308.00	£ 6,308.00	UK Average retained at UWTSD
Student enrolment (FTE)	f	3481		UWTSD 2015
Students residing on site	g		317	UWTSD 2015
Number of Students living off-campus	i		3164	
Number of Swansea based students living at home	j		37	UWTSD 2015 (1% of Swansea cohort)
Number of students renting private accommodation	k		3127	$k = i - j$
Estimated UWTSD Student Spending	l		£ 46,948,247.00	$l = a(2) \times f$
UWTSD student revenue (accommodation costs on campus)	m		£ 803,912.00	$m = d(2) \times g$
Estimated annual private landlord revenue from UWTSD Swansea student population	n		£ 10,240,925.00	$n = c(2) \times k$
Est UWTSD student spending (excluding all housing and participation costs)	o		£ 21,958,148.00	$o = e(2) \times f$
Est total UWTSD student expenditure, not captured by direct UWTSD outputs (UWTSD accommodation revenue and tuition costs excluded)	p		£ 32,314,322.00	$p = (L - m) - (b(1) \times f)$

- 14.14.9 Removing figures for housing and tuition fees, the estimated annual spend generated by the base figure of UWTSD Swansea based students in terms of living costs is in the order of £32.314m per annum. Given the distribution profile of students, it is reasonable to estimate that a large proportion of this spend is made locally within the City limits of Swansea.
- 14.14.10 Student expenditure locally therefore is considered to add considerable economic value to local shops and services, and would be in addition to the direct economic output generated by annual university activities.

14.15. Expenditure Projections

- 14.15.1 Projected student expenditure (At 2014/15 prices) at the planned completion of the UWTSD Core Academic projects is set out in Table 14.8 overleaf.
- 14.15.2 With projections of c3,900 FTE students (3,400 FTE of which will be based at SA1), the total UWTSD student expenditure (net of accommodation costs and tuition fees) is estimated to increase from £32.314m to £37,104m per annum (at 2014/15 prices). Total student expenditure projections increase from the base year (£46.9m) to £52.6m by the completion of the core academic projects.

Estimated Student Expenditure Profile (Economic Output): Projected Student Numbers at UWTSD (Swansea) Final Position (2021): 2014/15 prices				
Description	Ref	UK average	UWTSD Adjusted	Source
		(1)	(2)	
Average Annual Total Spending per Student	a	£ 13,909.00	£ 13,487.00	BIS SIES June 2013
Average Annual University participation costs (including Tuition Fees 2012/13)	b	£ 3,973.00	£ 3,973.00	BIS SIES June 2013
Average Annual Housing Costs	c	£ 3,628.00		BIS SIES June 2013
Average private rented accommodation in Swansea (rounded)	c(2)		£ 3,275.00	UWTSD 2015
Average Annual Housing Costs (UWTSD Adjusted, reflecting on-campus acc costs) (rounded)	d		£ 3,206.00	UWTSD average accommodation costs (private rented average plus on-campus average, blended)
Extracted accommodation costs (on-campus only)	d(2)		£ 2,536.00	UWTSD 2015
Living Costs (excluding Tuition and Housing Costs)	e	£ 6,308.00	£ 6,308.00	UK Average retained at UWTSD
Student enrolment (FTE)	f	3900		UWTSD 2015
Students residing on site	g		0	UWTSD 2015 (projection)
Number of Students living off-campus	i		3900	
Number of Swansea based students living at home	j		39	UWTSD 2015 (1% of Swansea cohort)
Number of students renting private accommodation	k		3861	$k = i - j$
Estimated UWTSD Student Spending	l		£ 52,599,300.00	$l = a(2) \times f$
UWTSD student revenue (accommodation costs on campus)	m		£ -	$m = d(2) \times g$
Estimated annual private landlord revenue from UWTSD Swansea student population	n		£ 12,644,775.00	$n = c(2) \times k$
Est UWTSD student spending (excluding all housing and participation costs)	o		£ 24,601,200.00	$o = e(2) \times f$
Est total UWTSD student expenditure, not captured by direct UWTSD outputs (UWTSD accommodation revenue and tuition costs excluded)	p		£ 37,104,600.00	$p = (L - m) - (b(1) \times f)$

14.16. Job Generation

- 14.16.1 Research undertaken by Drivers Jonas Deloitte “Employment Densities Guide” 2nd Edition 2010 supported by the Homes and Communities Agency (HCA) and Office of Project and Programme Advice and Training (OffPAT) provides a recognised industry benchmark against which the employment generation of a proposed development can be estimated. The 2nd Edition Guide updates the work previously undertaken by English Partnerships in 2001.
- 14.16.2 The Guide is based upon “employment density” ratios which are generally presented as the number of square metres per employee. The average floorspace requirement per full-time equivalent (FTE) employee of a particular use class can be used in a number of situations, including:
- (1) Forecasting the number of jobs that will be generated by a development.
 - (2) Developing a masterplan for a regeneration or economic development project to inform the selection of the best option for developing the site; and
 - (3) Assessing the value for money of the project, i.e. the cost per job (the sum of the public investment divided by the forecast number of jobs to be created).
- 14.16.3 For the purposes of this assessment, the first of these 3 situations is considered appropriate in the context of the SA1 Waterfront Innovation Quarter Masterplan project.
- 14.16.4 In relation to a number of use classes, the guide presents a range within which employment densities are reasonable. In certain instances the range can be considerable. The Guide however presents a single figure for each use class, presented as “Area per FTE” as m2. This is the base figure applied in this assessment.
- 14.16.5 The table below applies a “Gross to Net” multiplier as it is net internal area, measured in m2, which is applied to the employment densities for each use class. Net internal area is derived by applying a benchmark of 85% of gross internal area. For this assessment, we have applied a gross external area to net internal area multiplier of 85% for office and retail developments. The Guide acknowledges that the gross to net (internal) multiplier for multi-tenanted serviced office buildings can be as high as 25-30% (25% average) given the space allocated to common areas.
- 14.16.6 The assessment assumes that all buildings proposed, other than serviced offices, will be fully occupied. Serviced office buildings are assumed, in accordance with trends identified in the Guide, to be 75% occupied at any one time.
- 14.16.7 The predominant use class covered in this assessment is Use Class B1 (a) – commercial offices. Research and Development uses (Use Class B1b) and Light Industrial uses (Use Class B1c) are also proposed, but are anticipated to be a minority use within the employment B Use Class.
- 14.16.8 The Guide acknowledges that occupational densities for all office types increased from the 1st Edition to the Guide (2001). This is supported by anecdotal evidence at the time of the 2nd Edition which demonstrated a greater awareness amongst occupiers of the relationship between space efficiency and the cost of occupation. Higher densities are achieved through more efficient space planning, new ways of working and improved communications technology.

- 14.16.9 Serviced Offices achieve an occupational density of around 10m² per FTE. This reflects the space within the building devoted to reception, breakout spaces, meeting rooms etc. which can account for 30% of the total net internal area within a serviced office environment. This use type is characterised by changes in density as the nature of the occupier is innately flexible and occupational licenses can be short. An average of 25% vacancy at any one time is considered appropriate to reflect the constant “churn” of occupiers within a serviced office: vacancy rates can be experienced between 10% for cheaper, more economical spaces, to 30% in a premium serviced centre. A rate of 25% has been applied to the proportion of serviced office spaces envisaged within the SA1 development. Employment density estimates have been reduced in these buildings.
- 14.16.10 Where buildings have been identified as “light industrial”, we have applied the employment density at the lower end of that provided for “industrial” uses at 18m² FTE). The nature of these uses are anticipated to be entrepreneurial and associated with university activities. There is no clear industry standard for “light industrial” uses.
- 14.16.11 The uses proposed are not General Industrial in nature though such uses would fall within the employment use class and generate a higher employment density than other sub-categories within the employment use class.
- 14.16.12 The application of 18m² per FTE recognises that all occupiers are unlikely to be office based activities and that some testing / creative / laboratory uses may emerge. It is therefore possible that this sub-category of employment type could be considered a conservative estimate of the potential job generation within this sector. If the general office density were to be applied to the two “light industrial” indicative plots, the number of jobs generated would increase by 172.
- 14.16.13 The Guide clarifies that certain uses, such as retail, are dependent more upon turnover of the store than floor area per se: a retail unit within a good location with high visibility and a high footfall is likely to have a higher employment density than a retail unit of the same size in a poor location and/or with a low turnover.
- 14.16.14 In relation to restaurant uses, the range of employment density for most types of casual dining-type restaurants is 10-30m² per person. Variations within this range are caused by the following factors:
- (4) Number of transactions (e.g the turnover of covers/customers)
 - (5) Opening Times (e.g Lunchtime only or all day dining)
 - (6) Seasonal variation (e.g. summer trader greater than remainder of the year); and
 - (7) Brand and business model (e.g. upmarket operation will have a higher ratio of staff to covers/customers.
- 14.16.15 As stated above, the Guide advises that the gross to net internal multiplier of circa 80-85% is applicable to both retail and office developments. However, given that the specific nature of the retail occupier is not known at this point in time, we have “blended” the employment density for “high Street” retail (19m² per FTE) with that of “restaurants and cafes” (18m² FTE).
- 14.16.16 In light of this variation and to reflect the likely high footfall, longer opening hours, potentially higher transactions (and stronger brand), location on the edge of City Centre, proximity of a University campus / central business district, and also as a destination venue, we have applied an employment ratio of 18.25 m² FTE.

- 14.16.17 The SA1 development proposes a hotel at the southern tip of the peninsula. Hotel employment densities are affected by the class of hotel: classifications range from “Limited service”, through “Budget”, “Mid Market”, “Upper Class” and “Luxury”. The Employment density increases reflective of the quality of the hotel offer. A “Mid Market” hotel density has been applied in this assessment: 1 employee per 1.67 bedrooms. It is assumed, taking into account a reasonable proportion of floor space to conferencing, catering, dining and health club facilities, that the estimated number of bedrooms appropriate to a hotel of circa 5,000m² will be up to 100.
- 14.16.18 For the purposes of this assessment, residential units have been omitted from the schedule of accommodation. Given recent and emerging trends to work from home, it is possible that a proportion of the residential units will be occupied by those undertaking business or commercial activities (freelance, contract etc). The figures in the table below could therefore be supplemented by additional small scale enterprises.
- 14.16.19 The Accommodation Schedule underpinning the illustrative masterplan has been used as the basis for estimating the job generation potential of the proposed scheme. External areas associated with leisure and recreation uses have been excluded to provide a considered density figure.

Table 14.8 Employment Density Calculation Table

Building		Uses						TOTAL (m2)	Employment density and generation			
Plot ref	area m2 (GEA)	Retail	Business	Hotel	Sui Generis (Car Park)	University	Residential		Employment Density Category (2010 2nd Edt)	Gross external to net floor area multiplier	Area per FTE (m2)	Projected Number of Employees (rounded)
		A1,2,3,4,5, Shops Café etc m2	B1 Business m2	C1 Hotels m2	SG m2	D1 m2		m2				
no	m2											
PA	3900		3550					3550	General Office	0.85	12	251
		350						350	Retail	0.85	18.5	16
PB	17855		2770					2770	General Office	0.85	12	196
			1435					1435	R&D / Serviced Offices	0.75	10	108
		500						500	Retail	0.85	18.25	23
					13150			13150	Car Park	0		
PC	3410		3410					3410	Light Indusrrial	0.85	18	161
PD	3850		3850					3850	Light Industrial	0.85	18	182
C4	11136						10924	10924	Residenital	0		
		212						212	Retail	0.85	18.25	10
PF	6565					3490		3490	University	Within UWTSD total		
		425						425	Retail	0.85	18.25	20
			2650					2650	R&D / Serviced Office	0.75	10	199
PG	2540					2540		2540	University	Within UWTSD total		
PH	6170					6170		6170	University	Within UWTSD total		
PJ	5920					5920		5920	University	Within UWTSD total		
PK	400	400						400	Retail	0.85	18.25	19
PL	2620					2620		2620	University	Within UWTSD total		
PN	7595					7595		7595	University	Within UWTSD total		
PP	4330		2500					2500	R&D / Serviced Office	0.75	10	188
						1830		1830	Univesrity	Within UWTSD total		
PQ1	800					800		800	University	Within UWTSD total		
PQ2	450					450		450	University	Within UWTSD total		
PR	3470		1030					1030	General Office	0.85	12	73
		200						200	Retail	0.85	18.25	9
							2240	2240	Residenital	0		
PS	12322		7045					7045	General Office	0.85	12	499
		600						600	Retail	0.85	18.25	28
							4677	4677	Residential	0		
PT	6050		600					600	General Office	0.85	12	43
		450						450	Retail	0.85	18.25	21
				5000				5000	Hotel	0.8	1.67	60
									100 (beds)		FTE / Bed	
Sub-Total (Peninsular)		3137	28840	5000	13150	31415	17841	99383				2105
Proposals beyond the Peninsular on UWTSD controlled land												
A15	4216		4216					4216	General Office	0.85	12	299
A16	3856		3856					3856	Serviced Office	0.75	10	217
E6	7490	440						440	Retail	0.85	18.25	15
							7050	7050	Residential	0		
E7	3600						3600	3600	Residential	0		
E8	9400						9400	9400	Residenital	0		
E9	9800	4800						4800	Residential	0		
					5000			5000	Car Park	0		
F	1665					1665		1665	University	Within UWTSD total		
Sub-Total (Beyond the Peninsular)		5240	8072	0	5000	1665	20050	40027				531
Grand Total		8377	36912	5000	18150	33080	37891	139410				2636

14.16.20 In summary, it is estimated that circa 2,636 FTE jobs will be generated within the commercial zones of the masterplan. This figure excludes the UWTSD Swansea staff total which is estimated to be in the order of c580 FTE.

14.16.21 This figure does not take into account the temporary jobs generated during the phased delivery of the detailed proposals.

14.16.22 The estimated number of jobs generated by the development is therefore considerable and would lead to a major positive permanent effect on the local and sub-regional economy. Temporary positive impacts will also be generated during the construction stage of the project: this envisaged over the next 8-10 years, with University buildings planned for construction in the short term, ready for occupation in 2018/19.

14.17. The economic impact of construction

14.17.1 The construction value of the development is currently estimated to be in the order of £200m. The development will be constructed over an 8-10 year period, envisaged to start, subject to planning approvals, in 2016.

14.17.2 Research undertaken by the UK Construction Group (UKCG “Construction in the UK Economy” 2009: Updated in May 2012) concludes that every £1 invested in construction generates £2.84 in total economic activity. Construction is also defined as a ‘jobs creator’ - the sector being over three times more labour intensive than financial services and provides jobs for people from all educational backgrounds. UKCG also concludes that the construction industry has a very low reliance on imports. Construction imports less than 8% of its supply, meaning investment in construction is retained in the UK.

14.17.3 UKCG has also concluded that up to 95 pence in every pound spent on construction in different regions of the UK is retained in that locality – boosting the local economy. In the wider context, every £1 spent on construction yields a return of 56p to the Exchequer – net investment is therefore 44p in the pound.

14.17.4 Applying these ratios to the SA1 development project, and based upon a total construction value of c£200m, the added value to the UK economy arising from the project would be in the order of £568m, with up to £539.6m being retained in the local South Wales region.

14.18. Associated Development Opportunities

14.18.1 While not part of the SA1 masterplan, or the accompanying variation of condition application, the development of SA1 for UWTSD purposes will enable the University to rationalise its wider Swansea estate. Subject to planning approvals, and the phased delivery of development of SA1 for university use, UWTSD will seek to delivery positive planning objectives across its existing Swansea estate. Alternative uses for the Townhill, Mount Pleasant and, over time, the Ty Bryn Glas site will be investigated.

14.18.2 Re-use or redevelopment for a range of activities will be led by the market and informed by planning policies, and the opportunities and constraints of each site. It is possible that the University will retain Ty Bryn Glas in the short term, releasing land at Townhill and Mount Pleasant for residential, student accommodation, small scale retail, commercial enterprise and ancillary healthcare or leisure uses. Retained education uses will also be considered. The relocation of university activities will therefore offer the potential to realise new development, supporting economic, housing and social objectives across the City.

14.18.3 Reuse and/or redevelopment proposals will be fully tested at outline and/or detailed planning application stages, informed by public consultation and stakeholder engagement processes at the appropriate time.

14.19. Social Infrastructure: Baseline position

14.19.1 The University has a comprehensive programme of activities and initiatives aimed at opening up links with local communities and making the University accessible to a wider audience within Swansea.

14.19.2 Some of the ways in which the university currently provide a local community resource and engage with local people to promote and enable access to a higher education are summarised below.

Sports

14.19.3 The existing sports facilities at UWTSD are accessed by a range of local sports clubs including:

- Collaborative student learning experiences are in place with many local providers which will enable students to become involved in a number of industry based projects which include Swansea City FC, Carmarthenshire CC, WRU, Marriot Hotels, Iron Man Wales and Kaya World Music and Arts festival
- The Sports Management students make full use of the fully equipped Leisure Centre in Swansea and are regular visitors to the Premier League Liberty Stadium, developing their practical skills in sports coaching alongside key business and management modules to enable career progression.

14.19.4 These relationships will continue following the consolidation of UWTSD activities at SA1. It is the intention that the Sports Centre with an early delivery project at SA1 and that, subject to commercial viability and inward investment, could form the basis of a Sporting Centre of Excellence for the City.

Widening Participation

14.19.5 UWTSD has developed a comprehensive outreach and widening participation programme aimed at both attracting new students (primarily within the FE Sector) and supporting those already attending the college aimed at providing an equal playing field for student success.

14.19.6 A range of activities throughout the year aim to encourage individuals to consider attending university and to break down some of the myths and barriers which discourage some people from making that choice. Examples of recent and current initiatives include:

- Working with external partners such as schools and colleges to deliver outreach projects which aim to raise aspirations, build confidence and increase progression to higher education. By implementing University-wide measures to improve attainment and to provide support for pupils from local Communities First areas and other groups without a strong tradition of participation in higher education. Through their in-house Widening Access work within the University to help support entry and retention. By employing Student Ambassadors to help deliver activities.
- Funded by the Higher Education Funding Council for Wales Reaching Wider Initiative, UWTSD sits in the South West Wales Partnership. The partnership includes all the regions' higher education institutes, further education colleges, Careers Wales West and relevant schools. Initiatives under this partnership include:

i. Aiming for a College Education Day (ACE)

14.19.7 On an ACE day the University Of Wales Trinity Saint David students work closely with Key Stage 3 pupils through a series of activities aimed at raising aspirations to a higher education through increased awareness of student life, the different routes into HE and the variety of courses available.

ii. Summer University 2014;

14.19.8 The Year 12 Summer University is a free three week residential course Monday – Friday (or on a non residential basis if appropriate) aimed at Year 12 students studying for a Level 3 qualification in school or college in South West Wales.

iii. The 'Our Community Project'

14.19.9 This is a collaborative initiative between the South West Wales Reaching Wider Partnership and the University of Wales Trinity Saint David. Pupils will be given the task of creating a short documentary focusing on issues in their individual communities. The main focus of the project is to give an insight into the day to day lives and challenges facing Year 5 and 6 pupils in Communities First Wards in 2014.

14.19.10 The projects educational focuses are: Research skills, Confidence building, Social skills and the aim is to raise awareness of local issues including: Environment, Sustainability and Health.

Outreach

14.19.11 One objective for the outreach programme is the provision of a range of non-licensed venues for social activity, which are currently very limited but an essential feature of ensuring provision for a wide range of groups attending and visiting the University.

14.19.12 UWTSd activities and events advertised and for the external community are summarised in the Table 14.9 below.

Table 14.9 Events and attendance at Community events

Social, community and cultural engagement: designated public events		Free events		Chargeable events	
		Attendees	Academic staff time (days)	Attendees	Academic staff time (days)
Note: <u>Advertised events and events for the external community</u>					
1	2013-14				
1a	Public lectures	1,402	30.75	140	1
1b	Performance arts (music, dance, drama etc.)	709	27.5	5,321	31
1c	Exhibitions (galleries, museums etc.)	492	10.5		
1d	Museum education	75	2		
1e	Other Including, but not limited to: - S4C public meeting - Glass and Poetry Awards - Schools Conference (Classics) - Confucius Institute	2,587	60	344	20
	Total	5,265	130.75	5,805	52
2	2012-13				
2a	Public lectures	1,072	18.5	290	3
2b	Performance arts (music, dance, drama etc.)	463	7.5	4,818	42.5
2c	Exhibitions (galleries, museums etc.)	510	53		
2d	Museum education				
2e	Other	239	4.5	274	75
	Total	2,284	83.5	5,382	120.5

14.19.13 The Table above highlights that the last academic year for which records have been collated and verified, the University attracted 5,265 visits to free events and 5,805 visits for chargeable events. The largest events included the School of Performance (2,248 paid visits) and Ysgol Y Celfyddydau Perfformio (1,400 paid visits). The number of the free and paid event visits was greater in the academic year 2013/14 to that in 2012/13.

Library

14.19.14 The reference section of the libraries across the University Estate are free to members of the general public. Any member of the public can apply to become an external member of the library, allowing loan of up to ten books.

14.19.15 The library service within the University also has a number of reciprocal agreements and access schemes which enable non-students to gain free access to the university's resources.

14.19.16 The library service accommodates school visits during several months of the year and provides guidance and training in the use of the library and its resources and workshops on the development of research based learning skills. Sixth form students can access the library following their school visits, with full access to reference materials.

14.19.17 The intention at SA1 is to create a Digital Research Centre as part of the library that will enable students, staff and the wider community to access digital research materials held by the university, the National Library of Wales and other external groups. The library will also include a public exhibition area that will house travelling exhibitions from the National Library of Wales and other institutions as well as exhibitions created by the university.

Continuing Professional Development and Business Partnerships

14.19.18 The CPD team at the University arrange a programme of CPD related events each year, in support of industrial and commercial customers. These include:

Wales Institute for Work-based Learning

14.19.19 The University's Work-based Learning (WBL) provision is run by a dynamic team who deliver a range of high quality, innovative bilingual learning opportunities for its diverse body of learners.

14.19.20 Key features of this work-based learning include:

- Demand-led and quality assured learning that is customised to meet the needs of individuals and the development needs of their employers.
- Learning that is primarily work-based, which reduces the time needed to be away from the workplace. Following induction, our learner-centred programmes can be studied at work, at home or at a place where there is internet access.
- Negotiated, partnership-focused learning that involves the learner, employer and the University of Wales Trinity Saint David. All learners complete a work-based project to gain their Professional Practice qualification.
- Bilingual provision (Welsh and English).
- Accreditation of prior learning is key to the programme, either for learning gained through the experience of work or through previous study.
- A Higher Education accreditation service for appropriate in-house courses which adds value for both employers and employees.
- A wide range of modules that may be fully funded for eligible employers in the ESF Convergence Area.

Case study example

14.19.21 Porth Agored is a unique collaboration of 12 Local Authority Social Services departments from South West, Mid and North Wales (Neath Port Talbot, Swansea, Carmarthenshire, Pembrokeshire, Ceredigion, Powys, Gwynedd, Wrexham, Denbighshire, Flintshire, Conwy and Ynys Môn).

14.19.22 Working with the work-based learning team at Trinity Saint David, they jointly validated a Graduate Certificate in Consolidation of Social Work Practice. This is the first programme to be approved by the Care Council for Wales, as part of its new framework of Continuing Professional Education and Learning for Social Work in Wales, which aims to further improve the standard of social work practice and support social workers as they progress to the top of their profession.

14.19.23 Gwenda Thomas AM, Deputy Minister for Children and Social Services said:

"This is another key step in the professionalisation of social work. I am pleased that all the organisations involved in the design of this continuing professional education programme have successfully collaborated in preparation for this launch."

CPD of Substitute Teachers in South West Wales

14.19.24 Substitute teachers have major difficulties in accessing CPD, managing their performance and meeting any developmental needs. They may not be based in any school long enough to benefit consistently from the constant flow of information that normally comes through schools to teachers, including information about courses and other opportunities for continuing professional development. Substitute teachers experience difficulty in developing and extending reflective practice due to a lack of support networks and learning communities. The number of substitute teachers is growing which further exacerbates any potential problems caused by lack of CPD.

14.19.25 Key features of this CPD programme includes:

- Established a programme of support and development opportunities for substitute teachers.
- Sessions enable substitute teachers to: update their skills and knowledge; develop reflective practice; access opportunities for networking and collaboration and improve their confidence in terms of classroom and behaviour management.
- A website has been established which enables substitute teachers to communicate and share and develop good practice; share effective resources and be part of a support network and professional learning community.

Multi-faith Facilities

14.19.26 UWTSD currently has chapels at Carmarthen and Lampeter campuses, prayer room facilities at Carmarthen and Swansea (Mount Pleasant), and a mosque at the Lampeter campus. Such provision will need to be considered as part of the SA1 development.

Volunteering and Charity Fundraising

14.19.27 The Community Action Team at UWTSD facilitate community volunteering for students with a wide range of local organisations, community groups and charities. These include, but are not limited to the following initiatives:

METPOL

14.19.28 METPOL was set up in 2012 as Swansea Met Police student volunteer scheme. The scheme has been working with South Wales Police (Swansea Central station, Bridgend station, Townhill station and Cockett station), the Police Crime Commissioner, The Safer Swansea Partnership, Swansea Council, The British Business Crime Prevention Organisation, St Johns Ambulance Service, and UWTSD. METPOL has been awarded the High Sheriff Award in 2015 for the contribution it makes to the local community.

14.19.29 The scheme currently has 54 volunteers who have been, and/or are involved in a range of initiatives, including:

- (1) Operation Textbook
- (2) Operation Noise
- (3) One Punch Campaign
- (4) HELP Point
- (5) Business Crime Prevention Partnership

- (6) VOSA Checks
- (7) Youth Engagement in the City Centre
- (8) Townhill Football Academy
- (9) Drug Awareness Campaign

METFIRE

- 14.19.30 Set up in September 2013, METFIRE is a joint initiative with Mid and West Wales Fire and Rescue Service and follows the success of the METPOL activities above. There are currently 10 volunteers who have been involved in formal training. The scheme was nominated for a Mid and West Wales Fire and Rescue Service Celebrating Success Award in 2014. Schemes so far involve working with school groups, vulnerable adults, groups with learning or physical learning difficulties and disengaged youngsters.

Swansea Prison

- 14.19.31 UWTSD also arrange 10 volunteer placements with Swansea Prison. Volunteers are engaged in victim protection, restorative justice and administration support, in the learning environment and with young fathers.

Creative Bubble

- 14.19.32 Creative Bubble is a partnership between UWTSD and Swansea BID. Based in an empty unit in the City Centre, the students run workshops, exhibitions, community art sessions, performances, pop-up shops and events. These are all open to the public.
- 14.19.33 Creative Bubble has developed links with the Communities First team in Townhill to deliver various initiatives. Some of the projects are #LikeABoss (inspiring women and young girls to be entrepreneurial through enterprise workshops, motivational talks and sessions on image), Bubble Slam (sessions with young people to tackle Wales' shortfall in literacy levels – packaged up as scriptwriting and film-making), a selection of literacy workshops with specific groups, and Poets on the Hill.
- 14.19.34 In addition to the above, Creative Bubble also have Arts Council of Wales funding to run the Olion Festival in Townhill. Partnerships have also been established with other organisations such as Circus Eruption, Ethnic Youth Support Team (EYST), Swansea Young Single Homeless Project (SYSHP), Glynn Vivian Art Gallery, Swansea Music Art Dance (MAD) and other local organisations to run workshops and activities in the months leading up to the festival. The event is planned and managed by the Olion Youth Forum, a group of local young people aged between eleven and seventeen, UWTSD Swansea students, and members of the Communities First team.

Hywel Dda and ABMU University Health Board

- 14.19.35 UWTSD is in the process of creating a volunteer scheme with the Health Board for those students wanting to work in the healthcare system.

14.20. Social and Cultural Impact of Masterplan proposals

- 14.20.1 The developments proposed through the Masterplan will play an important role in enabling UWTSD to build on their existing work in this area and provide appropriate opportunities to existing and future students as well as the local community over the decades to come.
- 14.20.2 The Masterplan proposals make provision for the following development projects which are all proposed to be available for use, to varying degrees, by local community groups, organisations and the general public:

- (1) Enhanced Sports provision
- (2) The erection of a new multi-use Library and Resource Centre
- (3) New welfare and pastoral care facilities offered to staff and students.
- (4) New and refurbished catered venues and bookable rooms for meetings and functions.
- (5) New and improved pathways and amenity areas within SA1, ancillary to the enjoyment of those visitors using the area for meetings and attending functions.

14.21. Assessment of Effects

- 14.21.1 The revised proposals are designed and intended to be in accordance with the current and emerging generally supportive planning policy framework published by the City and County of Swansea.
- 14.21.2 The proposals are governed by, and respond to, the following core planning policy references, objectives, references to the evidence base and planned responses as set out within Planning Policy Wales, Technical Advice Notes and the City and County of Swansea's Unitary Development Plan:
- (1) The presumption in favour of sustainable development by means of supporting the growth aspirations of a Higher Educational Institution which generates a high relative economic output to the Welsh and UK economy (per FTE employees).
 - (2) Meeting the development needs of the area by fully utilising (concentrating and consolidating on) previously developed land identified as such
 - (3) Actively managing patterns of growth, aligned with commercial enterprise requirements, reducing the travel demand of university and commercial partners, and increase more sustainable modes of travel through a balanced package of travel plan measures.
 - (4) Supporting local strategies to improve social and cultural well-being for all, and helping to deliver facilities available for the community and services to meet local needs.
 - (5) The need to manage UWTSD operations in a sensitive manner through the means of a masterplan which will enable UWTSD to act as a facilitator and supporter of economic and social change in support of local suppliers, private landlords, shops, services and facilities.
- 14.21.3 The delivery of a phased programme of development and redevelopment proposals supporting both academic (operational), welfare and pastoral care initiatives, will generate additional expenditure in the City and beyond.
- 14.21.4 Notwithstanding the direct and indirect economic benefits arising from the phased construction activity to deliver what is estimated to be a c£200million masterplan building programme, and the university's direct outputs (staff salaries, research contracts and purchasing), applying current student spending estimates to future years, UWTSD student expenditure generates some £46.15m per annum, much of which is estimated to be spent within the region.
- 14.21.5 These estimates extract UWTSD revenue from student accommodation in both the base year (£0.74m). No student accommodation is proposed to be funded and managed by the University in future following its consolidation of its activities in Swansea at SA1.

14.22. Summary of Effects

- 14.22.1 UWTSD has a significant and notable positive impact on the economy, particularly in Swansea. Economic output also has a positive impact on the wider Welsh economy with the impact of UWTSD activities making a positive contribution as part of the network of Higher Education Institutions throughout the Wales and the wider UK.

- 14.22.2 Conservative estimates suggest that, in addition to direct UWTSD operational activities, UWTSD students currently spend in the order of £46.9m annually, £0.804m going to UWTSD for on-campus accommodation costs and around £10.240m going to private landlords across the City.
- 14.22.3 Removing all housing and tuition fees, the estimated current annual spend generated by UWTSD students in terms of living costs is in the order of £21.958m. Given the distribution profile of students, it is reasonable to estimate that a large proportion of this spend is made locally within Swansea.
- 14.22.4 Applying student projections, it is estimated that the total student spend on completion of the academic projects at SA1 would be in the order of equal to £52.599m (at current prices), much of which will be spent locally. Total projected spend excluding accommodation and tuition fees is estimated to be in the region of £24.6m compared to an equivalent current spend of £21.9m.
- 14.22.5 Student expenditure locally therefore is considered to add considerable economic value to local shops and services, and would be in addition to the direct economic output generated by annual university activities.
- 14.22.6 Expenditure generated by visitors to the UWTSD estate in Swansea are considered to have a minor long term positive effect on the underlying viability of existing businesses and suppliers.
- 14.22.7 The masterplan proposals will deliver a programme of phased academic (operational) and privately funded commercial, residential and quasi-leisure (retail) construction projects to support the growth aspirations of the University and the newly created expansion of the Central Business District in which it will be located. The proposals seek to not only redress current academic accommodation deficiencies, but also to meet modest increases in student and staff projections over the masterplan period.
- 14.22.8 One objective of the masterplan is therefore to retain and enhance the strong position UWTSD has within the Higher Education sector in Wales. This will enable UWTSD to retain and attract new staff and students and support a balance of uses across the SA1 waterfront regeneration area to meet local needs. The masterplan proposals are therefore considered to lead to significant positive, permanent and long term economic benefit to the local, regional and UK economy.
- 14.22.9 While the University's cultural impact is difficult to tangibly measure, empirical evidence suggests that the range and nature of its community engagement at a number of levels, results in significant and positive cultural and community impact in the locality. Enhanced facilities delivered through the masterplan period offer opportunities for ongoing cultural and community benefits and a stronger relationship between the University and the local groups and organisations.

15. Summary Effects Table

University of Wales Trinity Saint David - Summary Effect Table for the Environmental Statement Addendum												
Issue												
Date		3 (Final)										
Distribution:		29th July 2015										
		Submission and Project Team										
		Geographical level of importance of Issue					Nature of effect without mitigation					
Topic Area	Description of Effect	I	N	R	D	L	Impact	Duration	Permanence	Significance	Mitigation Measure(s)	Nature of effect with mitigation
Landscape Impact												
	Landscape Character				x		Positive	Long term	Irreversible	Moderate	Materials to adhere to Design Development Framework principles	Moderate (positive)
											Compliance with open space strategies to continue and ensure cohesion of approach	
	Townscape Character				x		Positive	Long term	Irreversible	Moderate	Consideration of elevational treatments	
											Placing of buildings to frame views	
											High quality design to contribute positively to the City, with use of local materials where possible	Moderate (positive)
											Strengthen the existing character (of predominantly built form)	
	Seascape Character			x			Positive	Long term	Irreversible	Moderate	Ensuring that there is connectivity to the waterfront and beach such as creating a 'green link' to the future tidal lagoon development and providing a biodiversity park area to the east of the tidal basin.	
											Proposed development along the Tawe river bank will further reinforce the connection of the city to the waterfront.	Moderate (positive)
											Extend the riverside walk and cycle links down to the peninsula linking riverside and its use as an amenity to the city.	
	Landscapes of Value - Swansea urban woodland Cultural landscape, Tawe Riverside and SSSI's			x			Positive	Long term	Irreversible	Moderate	Sensitive to adjoining communities – 'designing-in' for wider neighbourhoods	
											Enhanced access to SA1 – gateway features and improved connectivity	
											Encourage native planting where appropriate to increase bio diversity	Moderate (positive)
											Include street trees to aid microclimate and to visually enhance the site	
Visual Impact												
	Viewpoint 4				x		Positive	Long term	Irreversible	Minor	Construction: The proposals are expected to be developed over a 10 year period; this will reduce intensity of construction at any one time.	
											Provide temporary hoarding and screening to individual developments	Minor (positive)
											Operational: Placing of buildings to frame views	
											High quality design to contribute positively to the City, with use of local materials where possible	
	Viewpoint 5A			x			Positive	Long term	Irreversible	Moderate	Construction: The proposals are expected to be developed over a 10 year period; this will reduce intensity of construction at any one time.	
											Provide temporary hoarding and screening to individual developments	
											Where a plot is known not to form part of first phase or early development, the use of temporary landscapes could be considered to provide use of what would otherwise be derelict sites. This may not be appropriate in all cases and should be considered on a plot by plot basis.	Moderate (positive)
											Operational: Placing of buildings to frame views	
											High quality design to contribute positively to the City, with use of local materials where possible	
	Viewpoint 8A				x		Positive	Long term	Irreversible	Moderate	Construction: The proposals are expected to be developed over a 10 year period; this will reduce intensity of construction at any one time.	
											Provide temporary hoarding and screening to individual developments	
											-	
											Where a plot is known not to form part of first phase or early development, the use of temporary landscapes could be considered to provide use of what would otherwise be derelict sites. This may not be appropriate in all cases and should be considered on a plot by plot basis.	
											Operational: Placing of buildings to frame views	Moderate (positive)

	Viewpoint 16			x			Positive	Long term	Irreversible	Moderate	Construction: The proposals are expected to be developed over a 10 year period: this will reduce intensity of construction at any one time. Provide temporary hoarding and screening to individual developments Operational: Placing of buildings to frame views High quality design to contribute positively to the City, with use of local materials where possible	moderate positive
	Viewpoint 17			x			Negative	Long term	Potentially reversible	Moderate	Mitigate the loss of visual connection between the two landscape features – Swansea beach and Kilvey Hill with long term masterplan proposals providing a Green Infrastructure strategy: this to addresses landscape and ecology features within the wider context of the local area, ensuring that connectivity and biodiversity is encouraged by providing opportunities across the site.	Moderate negative
	Viewpoint 18			x			Positive	Long term	Irreversible	Moderate	Construction: The proposals are expected to be developed over a 10 year period: this will reduce intensity of construction at any one time. Provide temporary hoarding and screening to individual developments Where a plot is known not to form part of first phase or early development, the use of temporary landscapes could be considered to provide use of what would otherwise be derelict sites. This may not be appropriate in all cases and should be considered on a plot by plot basis. Operational: Placing of buildings to frame views High quality design to contribute positively to the City, with use of local materials where possible	Moderate positive
Traffic and Transport												
	Local Residents					x	Negative	Long term (operational phase)	Reversible		Implementation of travel planning and walking and cycling measures - post mitigation effect assumes the whole SA1 development is fully built out.	Minor (adverse)
	Employees in the area					x	Negative	Long term (operational phase)	Reversible		Implementation of travel planning and walking and cycling measures - post mitigation effect assumes the whole SA1 development is fully built out.	Minor (adverse)
	Road Users					x	Negative	Long term (operational phase)	Reversible		Implementation of highway improvements, travel planning and walking and cycling measures - post mitigation effect assumes the whole SA1 development is fully built out.	Minor (adverse)
	Sensitive groups (including the disabled, children and the elderly)					x	Neutral	Long term (operational phase)	Reversible		Implementation of travel planning and walking and cycling measures	Neutral
	Sensitive locations (Hospitals, Schools, Churches, Listed Buildings)					x	Neutral	Long term (operational phase)	Reversible		Implementation of travel planning and walking and cycling measures	Neutral
	Pedestrians					x	Negative	Long term (operational phase)	Reversible		Implementation of travel planning and walking and cycling measures - post mitigation effect assumes the whole SA1 development is fully built out.	Minor (adverse)
	Cyclists					x	Negative	Long term (operational phase)	Reversible		Implementation of travel planning and walking and cycling measures - post mitigation effect assumes the whole SA1 development is fully built out.	Minor (adverse)
	Open spaces / recreation areas					x	Neutral	Long term (operational phase)	Reversible		Implementation of travel planning and walking and cycling measures	Neutral
Ecology												
	Pollution arising from surface water runoff from the construction site lowering water quality within the River Tawe and adjacent docks.					x	Negative	Short Term (Construction Phase)	Reversible	Moderate	Implement best practice guidelines to protect water quality through a Construction Environmental Management Plan.	Neutral
	Pollution arising from fuel and other spillage from plant and construction activities affecting water quality within the River Tawe and adjacent docks.					x	Negative	Short Term (Construction Phase)	Reversible	Moderate	Implement best practice guidelines to protect water quality through a Contruction Environmental Management Plan.	Neutral
	Loss of habitat used for foraging reptiles and potential hibernation features.					x	Negative	Short Term (Construction Phase)	Irreversible	Minor	Undertake surveys to confirm the presence/ absence of reptiles. If presence confirmed develop a mitigation Strategy to safeguard the population, this is likely to include translocation to a suitable off-site receptor that will be managed to benefit reptiles.	Neutral
	Incidental injury or mortality of reptiles from plant and other construction activities.					x	Negative	Short Term (Construction Phase)	Irreversible	Minor	Undertake surveys to confirm the presence/ absence of reptiles. If presence confirmed develop a mitigation Strategy to safeguard the population, this is likely to include translocation to a suitable off-site receptor, that will be managed to benefit reptiles.	Neutral
	Loss of habitat used by ground nesting birds for foraging and nesting.					x	Negative	Short Term (Construction Phase)	Irreversible	Minor	Undertake site clearance in the winter when nesting birds absent. If this is not possible employ an ecologist to undertake a site survey in advance of site clearance and provide appropriate measures if nesting birds are found. Create new habitats of value to nesting birds within the landscape planting proposals.	Neutral
	Incidental injury or mortality of nesting birds from plant and other construction activities.					x	Negative	Short Term (Construction Phase)	Irreversible	Minor	Undertake site clearance in the winter when nesting birds absent. If this is not possible employ an ecologist to undertake a site survey in advance of site clearance and provide appropriate measures if nesting birds are found.	Neutral
	Disturbance to ground nesting birds from construction activities, whilst nesting.					x	Negative	Short Term (Construction Phase)	Reversible	Minor	Undertake site clearance in the winter when nesting birds absent. If this is not possible employ an ecologist to undertake a site survey in advance of site clearance and provide appropriate measures if nesting birds are found.	Neutral
	Construction activities could potentially aid the spread of Japanese Knotweed					x	Negative	Short Term (Construction Phase)	Reversible	Minor	Employ a specialist contractor to eradicate and treat the Japanese Knotweed in advance of site clearance.	Neutral
	Biodiversity Enhancement					x	Positive	Long Term	Reversible	Moderate	Produce a Landscape Strategy Plan that leads to the creation of habitats and features of value to biodiversity, in keeping with the location.	Minor to Moderate (Positive)
Cultural Heritage												
	Direct impact on the Prince of Wales Dry Dock (07239w)					x	Positive	Long Term	Reversible	Major	Development will preserve and enhance the Prince of Wales Dry Dock (07239w), and will restore links between the Dry Dock and part of the old tidal basin and the River Tawe. The development is also designed to increase the volume of visitors to what was originally a culturally vibrant and socially diverse area of Swansea. No further mitigation required.	Major (positive)

	Direct impact on the Lock (07238w)					x	Negetive	Long Term	Irreversible	Major	No above ground elements of the Lock (07238w) survive and the potential 'Major' effect is based on the assumption that below-ground elements of the structures will be encountered during the construction phase. Any intrusive groundworks required for the construction of the buildings located in the vicinity of will require an archaeological watching brief in order to record any surviving features or structures.	Neutral
	Direct impact on known peat deposits (4m in depth)			X			Negetive	Long Term	Irreversible	Moderate	Geotechnical investigations (2002 WAES) have identified peat deposits below approximately 3.5m of made ground. Any excavations to such depths should be monitored by an archaeological watching brief, with a particular emphasis on a peat sample strategy and subsequent analysis..	Neutral
	Indirect visual impact on ten sites of Regional importance			X			Negetive	Long Term	Reversible	Moderate	The indirect visual effect on the sites have magnitudes of effect ranging from 'Very Slight' to 'Considerable'. However, the previous assessments (2002 and 2010) did not consider any potential indirect visual effects of the development on archaeological sites. As a result the current assessment has considered the indirect visual effects of the entire development area, rather than being restricted to the areas subject to the 2015 masterplan changes. However, it is likely that if the areas subject to the 2015 masterplan changes were considered in isolation, then the indirect visual impacts on the sites noted above would be lessened.	
Socio-Economic												
	Economic Impacts - effect on local, regional and UK economy		x	x	x	x	Positive	Long Term	Partly reversible (in scenario that University were to contract),	Moderate	Universities are acknowledged to play an important role in the UK economy, with knock-on benefits generated by direct University activities and operations, and indirect benefits generated by student expenditure. The majority of student expenditure and the added value generated by construction contracts being retained within the local region. No adverse impacts have been identified. A consolidation of university activities at SA1, with a focus on supporting collaborative partnerships with third owner/occupiers and investors over the masterplan period is estimated to continue to generate economic benefits in the local economy, supporting local enterprise, shops and services. Impact significance greater (Moderate to Major) locally, with reducing significance as geographical context increases.	Moderate to Major (Positive)
	Local Business impacts				*	*	Positive	Long Term	Potentially reversible (in scenario that University were to contract)	Moderate	UWTSD attracts staff and students to the institution, but also business partnerships. The University undertakes research with and on behalf of a number of national and regional firms with local presence, as well as locally based enterprises: many of whom wish to locate close to university operations. Many UWTSD graduates are employed locally (within the County) post qualification, retaining skills within the area. A large number of UWTSD students are welsh domiciled, with around 20% of all students coming from Communities First areas. Commerial partnership activities will led to a variety of opportunities, ranging from incubator spaces to headquarters office complexes dictated by the market. It is estimated that in the order of 2,600 FTE would be generated by the development (excluding UWTSD staff).	Moderate to Major (Positive)
	Cultural Impacts				*	*	Positive	Long Term	Irreversible	Major	The University provides built and sporting facilities used by a number of local organisations. Improving the range of facilities generated by implementation of the masterplan will continue to support community interaction and use of university facilities. UWTSD staff and students make a considerable beneficial contribution towards local charitable fund-raising, volunteering and training and community initiatives: this is estimated to increase with a focussed university presence and joint initiatives with partners across SA1.	Minor (Positive - reflecting ongoing activities)
Flood Risk												
	Effectiveness of Sustainable Urban Drainage Systems as part of a water management strategy across the site			x	x	x	Neutral	Long Term	Irreversible	Minor	There are no SUDS features used as part of the surface water drainage strategy for the development. There is a free discharge to the River Tawe or Prince of Wales Dock. Ground contamination precluded the use of infiltration drainage.	Minor / Neutral
	Overloading of sewer network		x	x	x	x	Adverse	Long Term	Reversible	Major	The foul sewer network in roadways has been designed in consultation with Welsh Water to Sewers for Adoption specification to accommodate the development flows and can also serve the proposed masterplan without improvement. The spur connections would be designed to not overload the system based on the proposed development.	Neutral
	Improving water quality in the existing docks				x	x	Positive	Long Term	Potentially reversible	Moderate	The use of oil separators for highways drainage will reduce hydro-carbons entering the water cycle and providing an impermeable surface (tarmac or concrete) over the majority of the development area will prevent existing contamination / leachate reaching the dock through infiltraion.	Moderate (positive)
	Tidal flood risk with the possible construction of tdal lagoon			x	x	x	Positive	Long Term	Reversible	Minor	The proposed construction of the tidal lagoon will introduce a walled sea defence to the southern edge of the development, decreasing the likelihood of tidal flooding from the Bristol Channel.	Minor (positive)
Ground Conditions												
	Persons coming in contact with Made Ground on site					x		Short (Construction phase) and Long Term (site end users)	Irreversible and Reversible	Major	The potential impacts to construction workers and end users from contaminants in Made Ground will be mitigated through the adoption of appropriate health and safety practices, as outlined in the Code of Construction Practice (CoCP) and remedial action adopting the suitable for use principles, as set out in CLR-11.	Neutral
	Persons coming in contact with contaminated soil/ dust resultant from historical site use					x		Short (Construction phase) and Long Term (site end users)	Irreversible and Reversible	Major	All persons engaged in site construction works will be made aware of the findings of the intrusive investigations and the hazards associated with handling potentially contaminated materials. All works will be conducted in accordance with The Construction (Design and Management) Regulations 2015 (CDM 2015) and appropriate PPE will be adopted during the construction works. A remedial strategy, following the principles of CLR-11 will be implemented to ensure protection of end users.	Neutral
	Persons coming in contact with ground gases generated from underlying soils					x		Short (Construction phase) and Long Term (site end users)	Irreversible and Reversible	Major	Gas monitoring will be undertaken prior to construction to determine the hazourdous gas regime (if any) on the site and the appropriate gas protection measures that are required in the proposed buildings on the site and suitable precautions to be protective of construction workers.	Neutral
	Persons coming in contact with groundwater contaminated from historical uses on and/ or off site					*		Short (Construction phase) and Long Term (site end users)	Irreversible and Reversible	Major	The potential impacts to construction workers and end users from contaminants in groundwater will be mitigated through the adoption of appropriate health and safety practices, as outlined in the Code of Construction Practice (CoCP) and remedial action adopting the suitable for use principles, as set out in CLR-11.	Neutral
Air Quality												
	Off site air quality impacts at human and ecological receptors caused by vehicle exhaust emissions				x	x	Negligible	Long Term	Potentially reversible vehicles stopped travelling to and from the site	Negligible	Production of a Travel Plan, integration of green infrastructure into development, inclusion of facilities to encourage cycling, low NOx emission boilers and provision of electric vehicle charging points.	Negligible

	Exposure of future residents to Air Quality Objective exceedences					x	Negligible	Long Term	Potentially reversible if residential plots are changed to other land use	Negligible	None required	Negligible
Noise												
	Traffic generated noise beyond site boundary (and impact upon students residing on site within new study bedrooms)						Negative	Long Term	Irreversible	Minor	Mitigation incorporated into the design of building faacades and selection of appropriate specification glazing	Negligible
	Traffic generated noise on-site (and impact beyond the site boundary)						Negative	Long Term	Irreversible	Minor	Mitigation incorporated into the design of building faacades and selection of appropriate specification glazing	Negligible
Waste and Recycling												
	CD&E Waste Arisings				x	x	Negative	Short Term (Construction Phase)	Partly Reversible	Moderate	Implementation of Construction Environmental Management Plan (CEMP) and Site Waste Management Plan (SWMP)	Minor
	Operational Waste				x	x	Negative	Long Term	Permanent	Minor	Implementation of County recycling initiatives	Minor
Infrastructure and Uittilities												
	Energy generation potential			x	x	x	Positive	Long Term	Reversible	Minor	There is potential for small scale solar or wind generation on the development - this would require specialist advice with regards to viability.	Minor (positive)
	Increased pedestrian / cycling links			x	x	x	Positive	Long Term	Reversible	Moderate	The construction of a footbridge over the Prince of Wales Dock will reduce journey times for pedestrians / cyclists. New pedestrian link on southern side of Prince of Wales Dock linking two halves of the development.	Moderate (positive)
										Neutral		Neutral

16. Conclusions

- 16.1.1 This Environmental Statement refers to the multi-disciplinary approach undertaken by the appointed consultant team. Proposals are presented as a considered response to the site, its wider setting and the town planning framework. Where required, mitigation measures have been identified in line with appropriate and prudent site and estate management objectives.
- 16.1.2 In short, the masterplan proposals will cement the University as a catalyst for change and in support of both sustained economic growth and cultural engagement for the city of Swansea.
- 16.1.3 The key elements that will help deliver the University's vision are joint infrastructure investment; developing the SA1 masterplan to reflect the new joint economic/ educational regeneration delivery opportunity; a targeted joint approach to engagement with business and the promotion of entrepreneurial, research and commercialization opportunities.
- 16.1.4 The Welsh Government and UWTSD as the major landowners in SA1, are committed to the economic and social regeneration of the whole Swansea Bay City Region. They have agreed to work together as partners. Their objective is to develop a joint vision, the Waterfront Innovation Quarter, to maximise the positive impact the development of SA1 can bring to Swansea City Centre and the wider Swansea Bay City Region.
- 16.1.5 The development proposals have regard to the multitude of development constraints facing the Campus, notably, but not limited to, cultural heritage, ecology, topography and drainage, access and movement and the planning policy framework which places much of the site within the Green Belt.

The role of the University as a catalyst for change

- 16.1.6 The University of Wales Trinity Saint David SA1 project is both a participant and catalyst in this broader pattern of change in Swansea. At its core is the mission to equip students with the training and skills necessary to enable them to lead in the creation of the new knowledge intensive economy of Wales.
- 16.1.7 The economic, social and cultural context of Wales is changing in response to remorseless global scale forces. The University of Wales Trinity Saint David SA1 project is a vital component of Swansea's response aimed at capturing the potential benefits for the graduates of the University and for wider society.

The Swansea Waterfront Innovation Quarter

- 16.1.8 Planning policy has supported the regeneration of the SA1 area for many years. The development proposals set out within this document are consistent with adopted Unitary Development Plan policies, emerging Local Development Plan policies and are aligned with the aspirations of the City and County of Swansea as relayed in the January 2015 City Centre Strategic Framework Review. The proposals seek to refine and develop previous masterplan proposals to facilitate the creation of a consolidated university at the heart of a mixed use commercial area of an extended City Centre.

Working in Partnership – a process of collaboration

- 16.1.9 The masterplan process underpinning the variation of condition planning application has involved a multi-disciplinary consultant team engaging with the University and third party interests over a 12 month period. The University facilitated and participated in numerous design team meetings, briefing sessions and interactive workshops with the Welsh Government (as landowner and joint applicant), the Design Commission for Wales, the Prince's Foundation Building Communities and the City and County of Swansea.
- 16.1.10 Representations received during a six week public consultation process have been evaluated and have not only shaped elements of the masterplan strategy and the design code but will also have refine and develop future plot management strategies during and after the development has been delivered.

Reference Documents

- 16.1.11 The Environmental Statement Addendum is one of a number of core documents submitted to the City and County of Swansea, as Local Planning Authority, in support of a variation of condition application. Other documents include:
- 1) Design and Development Framework Part 1: Planning Design and Access Statement (collated by Stride Treglown Limited)
 - 2) Design and Development Framework Part 2: The Design Code (Prepared by Stride Treglown Limited and the Princes Foundation Building Communities)
 - 3) Transport Assessment (prepared by Hyder Consulting)
 - 4) Draft Travel Plan (prepared by Hyder Consulting)
 - 5) Statement of Community Involvement (jointly prepared by UWTSD and Stride Treglown Limited)
 - 6) Environmental Statement Addendum: Technical Appendices (collated by Stride Treglown Ltd.)
- All documents dated July 2015.



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David



Lywodraeth Cymru
Welsh Government

Variation of condition application relating to outline planning
permission 2008/0996 (granted 11th October 2010) at SA1
Swansea Waterfront Innovation Quarter