Appendix A
St Athan EIA Scoping Opinion

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Metrix and the Welsh Assembly Government, C/o Agent.
Entec UK Ltd., Pacific House, Imperial Way, Reading., RG2 0TD

St. Athan

Scoping request - Redevelopment of MoD St. Athan as a Defence Technical Academy (DTA) and Aerospace Business Park (ABP)

INTRODUCTION

A request has been made under Regulation 10 of the Town and Country Planning (Environmental Impact Assessment) (England & Wales) Regulations 1999 (as amended by Town and Country Planning (Environmental Impact Assessment) (Amendment) (Wales) Regulations 2006) for a Scoping Opinion prior to the preparation of an Environmental Statement to accompany planning applications for the Proposed defence Training Academy and Aerospace Park at St Athan.

The applicants have accepted that an ES is required on the basis that the proposed development is classed as an 'urban development project' that exceeds the 0.5 hectares (ha) threshold set out in Schedule 2, Regulation 2 (1) 10 (Section b of the 1999 Regulations) and as potential significant effects may arise as a result of the development.

The applicants have submitted an extensive report providing information on the nature of development, possible significant environmental effects that it could have on the environment, and the suggested context of the ES.

The submission has formed the basis of the Council's consultations with statutory and non-statutory bodies, with comments received informing the scoping report, and such responses to be provided to the applicants. Formal consultations will, of course, also be undertaken at application stage.

This scoping opinion will inform the applicants as to the content of the Environmental Statement (ES) as part of the Environmental Impact Assessment (EIA) process. It will consider the applicants submissions and identify aspects of the proposal which require attention during the preparation of the ES. The Council reserve the right to request and further information which, as part of the EIA process, may be subsequently required to inform consideration of the scheme at application stage.

SITE DESCRIPTION

The site comprises the former RAF St Athan base (approximately 293 hectares), plus approximately a further 160 hectares adjacent to the site, the full extent of which is shown on the plan(s) accompanying the scoping report.

The proposed development is to cover the current military base, plus additional land either already acquired, or being acquired, by the Welsh Assembly Government around the airfield, in addition to land further away from the airfield

that is required in connection with improvements to road and waste water treatment infrastructure.

DESCRIPTION OF DEVELOPMENT

Metrix, the Ministry of Defence (MoD) and the Welsh Assembly Government are proposing to submit planning applications to support the major redevelopment of MoD St Athan in South Wales as a military training and teaching facility, and a major aerospace centre of excellence. This facility will be known as St Athan – Home of the Defence Technical Academy and Aerospace Park

The development proposals are likely to be based upon two main planning applications covering the following elements:

Development of a new Defence Technical Academy, including:

- The use of the existing superhangar for training purposes;
- A new energy centre (probably a combined heat and power biomass plant);
- A Royal Electrical and Mechanical Engineers (REME) museum;
- Sports and recreation facilities;
- Single living accommodation for visiting trainees and military personnel;
- A crèche;
- The restoration of an existing Grade II church building on Eglwys Brewis Road;
- Field Training Areas, including the relocation of some existing training areas from the DTA site to land to the east of Cowbridge Road;
- Service Family Accommodation (SFA) housing (up to 550 dwellings);
- On and off-site highway works, including a new access road from the B4265 and improvements to the existing Eglwys Brewis Road, St Athan road junction, Waycock Cross road junction, and the B4265 road at Gileston Old Mill; and
- Improvements to Llantwit Major Sewage Treatment Works (STW), including requisition of a new rising main sewer from the St Athan site to the STW and a small extension to the existing works on its southern side.

An Aerospace Business Park (ABP), including new and additional hangars and buildings to the north and south of the main runway, including;

- A new southern access road from the B4265 to serve the area south of the runway;
- The same on and off-site highway works as for the DTA development, including a new access road from the B4265 and improvements to the existing Eglwys Brewis Road, St Athan road junction, Waycock Cross road junction, and the B4265 road at Gileston Old Mill; and
- The same improvements to Llantwit Major Sewage Treatment Works (STW) as for the DTA development, including requisition of a new rising main sewer from the St Athan site to the STW and a small extension to the existing works on its southern side.

PLANNING HISTORY

The site has an extensive and detailed planning history relating to RAF St Athan (all CROWN apps). These are not explicitly relevant to this scoping opinion and are therefore not listed.

CONSULTATIONS

A number of statutory and non-statutory consultations have been undertaken on this request for a formal scoping opinion, with responses received from the following bodies, and their representations summarised and discussed below, as well as in the main issues of the report: -

1. St. Athan Community Council (information purposes only). Verbally advised that they have no comments on the Es but will respond in detail at application stage.

2. Environment Agency Wales

   EAW advise, in general, that "the Scoping Report appears to be comprehensive in scoping those issues to be included as part of the Environmental Impact Assessment (EIA) process. Overall, we agree with the topics included in Table 1.1 for inclusion in the EIA, although it is not clear to us whether the effects relating to new foul sewerage infrastructure are also being considered. We also confirm that the EIA will need to consider direct, indirect, cumulative, short, medium, long-term, permanent, temporary, positive and negative effects, including their inter-relationship.

   Schedule 4 of the Town and County Planning (Environmental Impact Assessment) (England and Wales Regulations) Regulations 1999 (SI No. 293) also comments that an outline of the main alternatives, reasons for choice, taking account the environmental effects should be considered. We suggest that this aspect should also be considered as part of the EIA."

   They have provided extensive comments in respect of the scoped topics, which are detailed in their submissions which are attached to this report as Appendix A.

3. Dwr Cymru/Welsh Water South West

   Further to your letter dated 11 July 2008, we agree in principle to the Environmental Impact Assessment Scoping Report, however we wish to raise the following points:

   Sewerage

   Page 29 – *Section 3.6 Table headed "Next steps in the EIA process"*

   To address any local issues that may arise we suggest taking actual odour readings from our Llantwit Major (WwTW) rather than relying on old information.

Page 45 – *Section 3.9 Hydrology*

We would like to see a specific section on Water Quality and suggest adding it to the Hydrology section.

This section should include the discharge from Llantwit Major WwTW and raw water extraction. Also it is understood that the development will require a foul water sewage pumping station to drain the site, this being the case it will need to be assessed to determine any potential impact on the environment e.g. odour issue, emergency over flow and noise.

The table under Section 3.10 of page 47 may have a bearing on raw water extraction.

Page 50 – *Section 3.12 table headed "Hydrology and Flood Risk"*

We suggest the words in bold below should be added to this paragraph:

"The quality and quantity of all site discharge and quantities will be subject to a modification to the discharge consent which will be agreed with the EA prior to **design and** construction."

We also advise that during the construction period the foul flows from St. Athan to the Aberthaw WwTW need to be restricted to existing level.

Page 53 - *Section 3.10.2*

We would also comment that the visual impact of the Llantwit Major WwTW extension has not been mentioned and that particular emphasis will be placed on the WwTW in line with any previous considerations taken into account for this site.

Page 65

In relation to the noise implications these will need to be fully investigated to ensure no detriment to the environment.

<u>Water</u>

With regards to the clean water supply to the site, we would like to comment as follows.

As you may be aware there is an existing supply serving the site, however, this supply will need to be increased prior to the redevelopment of the site. Given the current condition of the local infrastructure and the likely increase in the demand, it is highly likely that reinforcement works will be required. Consequently, if works are identified to be carried out, additional construction works will be required which may not be covered by the current extent of the environmental scope. At this moment in time we do not know what the extent of any works are, therefore, we cannot recommend how the scoping report should be amended to reflect them. We would suggest that a section be included that highlights this in the event works are required, their effects on the environment should be considered in full.

These comments are attached to this report as Appendix B.

4. Civil Aviation Authority

The full comments of the Airport are attached to this report, and do not raise concerns with the report. They note, however, that they would need to be consulted at application stage where a more detailed assessment of hazards can be made (including choice of materials with respect to any impact on radio signals) and that access would be required at all times during construction to monitor bird activity if require din the interests of highway safety.

These comments are attached to this report as Appendix C, and will be provided in full to the applicant to inform subsequent submissions.

5. Head of Visible Services (Highways) advise as follows: -

"It is recognised that the construction processes and eventual use of the development proposals for the DTA are somewhat fluid at present – a factor that the scoping document duly recognises.

Thus the content of the document is drawn sufficiently widely to cover the eventualities that are presently being made known to us.

I have noted the following specific matters

(1) **3.3 – Cumulative Effects & Appendix G – Page G1** - Reference is made to WAG proposals to trunk the A48 and A4226 leading to the airport and a link road from M4 to CIA. These are speculative statements considering the progress of the ongoing Arup studies for the WAG. In addition, the final paragraph of this section needs consider proposed (and possible?) future developments outside the VoG

(2) **3.12.1 & Appendix G – Page G1** - Reference is made is to Capita Symonds having prepared a TA dated Dec 2006. I am not aware that this has been made available to us (enquiries to Capita were also vague on this matter). We have a version dated June 2006 which we felt was somewhat lacking in detail for a development of this magnitude. Therefore this is a matter to watch in due course when the development proposals are in a more advanced state."

These comments are attached to this report as Appendix D

6. Environmental Health

Advises as follows:

"We are satisfied with the scoping request and the forward actions proposed for the EIA with regard to Noise; Air Quality (see below); and Contaminated Land.

Observations

CHP plant — The presence of a combined heat and power plant may impact upon air quality. A stand alone permit will be required for this installation. However its contribution to local air quality must be considered in the context of the EIA

Lighting — With some exceptions external lighting may impact upon residential amenity (also can be subject of statutory nuisance). Schemes should take into account the ILE code for avoidance of obtrusive light

These comments are attached to this report as Appendix E

7. Countryside Council for Wales

In general, CCW welcomes and supports the scoping document and we welcome the work which has been carried out to date and the proposals for further assessment work, particularly on populations of European Protected Species known to occur on site (great crested newts, bats and otters). We look forward to continuing to work closely with the applicant and their agents to ensure these species are adequately considered within the EIA and application process. However we do have one or two comments to make.

We note the methodology for identifying valued ecological receptors outlined in Box E1 (pgE7), however we have some concerns in relation to certain judgements that are then made on this basis. For instance, although we accept from previous survey results the likelihood of them occurring on site is small, we do not consider that water vole should be considered as a non valuable receptor, particularly given their status in the United Kingdom Biodiversity Action Plan (UKBAP), and their well documented and dramatic decline over the last 20yrs. Any population of water vole regardless of size should be considered as significant.

The overall approach which suggests impacts on any population of species judged to be of district value or less cannot be considered as significant may not be appropriate and given your general duty to have regard to conserving biodiversity, as set out in section 40 of the Natural Environment and Rural Communities (NERC) Act (2006).

We recommend that you speak to your Authority's Ecologist regarding the status of locally important biodiversity features and the need to assess the impacts of the proposals upon them.

These comments are attached to this report as Appendix F

8. Glamorgan Gwent Archaeological Trust (GGAT)

We have read section 3.7 *Cultural Heritage* and Appendix D *Approach to Cultural Heritage Assessment* of the scoping report with great interest. The proposed methodology for assessing the impact of the proposed development on the cultural and archaeological resource is logical and meets current professional standards. Consequently, in our role as the archaeological advisors to your Members, we can advise you that the work outlined in the scoping report to assess the impact of the proposed development on the cultural heritage is appropriate and recommend that you accept this section of the proposed assessment.

These comments are attached to this report as Appendix G

9. Ecology

The Council's Ecology Officer advises as follows: -

Habitat Assessment

It is recommended that an assessment be carried out on the effects on habitat surrounding the Waycock Cross junction. CCW Phase 1 survey work identifies unimproved grassland adjacent to the Waycock Cross junction.

Water Vole

The biodiversity evaluation does not identify water vole as a valued ecological receptor (value is judged as district level only). It is noted that water vole are unlikely to be present on site. However, given national declines in the species and that no populations are known to survive in the Vale, it is recommended that water vole be considered a valued ecological receptor.

It is noted that survey-work is ongoing to confirm presence/absence due to the species' legal protection.

These comments are attached to this report as Appendix H

10. Cadw

Advises that the chapter on Cultural Heritage (3.7) is adequate and accurate, although it is noted that:

- neither Cadw nor the Historic Environment Record held by the Royal commission of Ancient Historical Monuments of Wales were consulted by Cotswold Archaeology during their Desk Based Assessment
- the scheduled ancient monuments listed on page 31 is incomplete, omitting East Orchard Wood Pillbox (GM598) and Limpert bay Anti-Invasion Defences (GM601), both of which are new schedulings;
- it is understood that you are aware of proposed scheduling activity relating to RAF St Athan's ground perimeter defences

Cadw is content that the identification of the next steps in the assessment processes in accordance with expected standards and guidelines

In response, Cotswold Archaeology (as a result of Nicky Bailey from WAG requesting additional comments) have advised as follows:

- as pages 6-7 of our report states both Cadw and RCAHMW were consulted. Cadw provided paper mapping and site details for the original assessment in 2001, and provided digitally updated data as shapefiles which were received on 4th September 2007. The RCAHMW Aberystwyth offices were visited and their archaeology archive and air photos examined by us on 20th Nov 2007. It clearly says this on page 7 of our report!
- Cadw say in their comments that these two defensive sites are new schedulings, and they have certainly been added subsequent to our report. In fact, we receive new digital data for all SAMs in Wales from Cadw every 6 months (last received 18th July 2008) and the sites are not even on that data set.

Cadw's representations, and the latter emailed comments, are attached to this report as Appendix I (i) and (ii)

REPORT

Issues

In reaching a scoping opinion, the Council must have regard to the matters listed in Paragraph 10 (6) of the Regulations, which requires that the following matters are taken into account:

(a) the specific characteristics of the particular development;
(b) the specific characteristics of development of the type concerned; and
(c) the environmental features likely to be affected by the development.

In assessing the environmental impact of the development, the submitted report has considered the scope of the Assessment against the following main issues, each of which are considered in turn below: -

- Land Quality and Hydrogeology

  EAW and Environmental Health confirm the need for the next steps of the EIA process to assess the effects of the proposed development during construction and in the long term on residual contamination and ongoing natural attenuation.

  EAW also recommend that the impact of dewatering etc. (table 3.4) should additionally consider the location of any zones of dewatering relative to areas of residual groundwater contamination and programmes of monitored natural attenuation. Any poor quality water drawn in by dewatering would need to be appropriately treated and/or disposed of at an authorised facility, whilst any effects on the remedial programme would also need to be monitored and mitigated as necessary.

  Furthermore, whilst the site has been subject to investigation and remediation work, they recommend that it would nonetheless be advisable for the Site Environmental Management Plan (SEMP) or similar to include contingency measures to be followed in the event of any previously unidentified contamination being encountered during the redevelopment phase.

  Likewise, if, in the adoption of SUDS for surface water drainage at the site, there are likely to be infiltration techniques or elements of soakage into the ground, these will need to be located so as to avoid mobilisation of residual contamination.

- Community

  The scope of the ES relating to the impact on community interests is noted and accepted.

- Air Quality and Odour

  The EHO advises that the presence of a combined heat and power plant may impact upon air quality, and that its contribution to local air quality must be considered in the context of the EIA.

  This view is reinforced by EAW who advise that Section 3.6.2 of the Scoping Report in respect of air quality baseline conditions does not consider the impact of the proposed energy centre on emissions to air, noting that depending on its size there may be an impact on NOx levels.

  Dwr Cymru Welsh Water (DCWW) advises that table 3.6 (p.29) concerning *"Next steps in the EIA process" requires amending to* address any local issues that may arise, and suggest taking actual odour readings from their Llantwit Major (WwTW) rather than relying on old information.

- Cultural Heritage

  The Council's advisors, Glamorgan Gwent Archaeological Trust have advised that the proposed methodology for assessing the impact of the proposed development on the cultural and archaeological resource is logical and meets current professional standards. Consequently, they advise that the work outlined in the scoping report to assess the impact of the proposed development on the cultural heritage is appropriate and recommend that the Council accept this section of the proposed assessment.

- Ecology

  The Council's ecology team have considered the submissions and, in respect of Habitat assessment, recommend that an assessment be carried out on the effects on habitat surrounding the Waycock Cross junction, given that a CCW Phase 1 survey work identifies unimproved grassland adjacent to the Waycock Cross junction.

  With respect to Water Vole, they note that the biodiversity evaluation does not identify water vole as a valued ecological receptor (value is judged as district level only). They note that water vole are unlikely to be present on site, however, given national declines in the species and that no populations are known to survive in the Vale, it is recommended that water vole be considered a valued ecological receptor. They note that survey-work is ongoing to confirm presence/absence due to the species' legal protection.

  It is noted that EAW have provided comments on biodiversity matters and concur with the above view that water vole should be considered a valued ecological receptor. They also state that, with respect to habitats, those that are designated, rare or support valuable species should also be considered valuable, and also recommend that (given their legal and/or declining status) further advice is sought on the need to elevate badgers and reptiles to 'valued ecological receptor' status.

  We note that all species and habitats that are not noted as 'valuable' are automatically considered 'not valuable'. During the detailed survey stage, species of conservation importance may be recorded whose presence had not previously been considered likely. It is important that there is a mechanism by which these species can be added to the 'valuable ecological receptor list', even if nominally they would fall into the 'not valuable' list.

  EAW express concerns about the approach taken (Appendix E) is to consider species/habitats of district or local value as non valuable ecological receptors. They are of the opinion that these should be considered valuable. If the approach taken by all developers was to consider habitats/species of local and district importance as non valuable, cumulative losses would be significant and the status of these receptors would soon be elevated. In their opinion, it is not acceptable to wait for this to happen before considering the need to mitigate impacts.

The Countryside Council for Wales (CCW) similarly raise concern in relation to judgements that are made, and also state that any population of water vole regardless of size should be considered as significant. They also consider the overall approach which suggests impacts on any population of species judged to be of district value or less cannot be considered as significant may not be appropriate, given the general duty to have regard to conserving biodiversity, as set out in section 40 of the Natural Environment and Rural Communities (NERC) Act (2006).

The detailed comments of the ecology officer, EAW and CCW on such matters (attached) should therefore be incorporated into the ES.

- Hydrology

  EAW have expressed some concerns in their representations and require the following to be addressed (see EAW response for full details): -

  - The report comments that there are no development advice map zones (Technical Advice Note 15 Development and Flood Risk July 2004 (TAN15)) along the Boverton Brook. This is incorrect because there are areas of zones C2 and B along both the Boverton Brook and the Llanmaes Brook.

  - In order to establish existing and post-development flood risks and consequences the applicant will need to carry out, submit and agree a hydraulic modelling of the relevant watercourses. It is particularly important to establish that there is no increased flood risk to existing property in the Boverton Brook catchment considering the history of flooding.

  - The report refers to the latest climate change guidance from Department for the Environment, Food & Rural Affairs (Defra) which requires a factor for climate change to be applied over a 50 year lifetime of development. It is possible, however, that for dwellings the lifetime to be considered will increase (in the near future) to a more realistic 100 years and we recommend that this scenario is also considered within the assessment.

  - With regard to surface water drainage from the site, TAN15 requires Sustainable Urban Drainage Systems (SUDS) to be utilised wherever possible. Where a conventional drainage system is proposed then we would expect justification and reasoning to be provided by the applicant as to why SUDS are not appropriate. Any conventional system should improve on the status quo.

  - In respect of attenuation requirements, Greenfield run-off figures have been recalculated for the Boverton Brook catchment. We advise therefore that the runoff from the site should not normally exceed 3.9 litres/sec/hectare (whole site). The minimum storage requirement (including an allowance for climate change) is 470 cubic meters per hectare of impermeable surface. Please note that these

figures may be subject of future changes when better flood estimation methods and data becomes available.

EAW have also provide detail comments in respect of water quality, expecting measures to be implemented to ensure no derogation of water quality and where possible improvements, and requiring that the extent and nature of pollution prevention measures will need to be detailed in the ES to provide sufficient assurance that potential and direct effects on water quality can be mitigated.

In respect of Off-site Sewage Treatment Works and Drainage works, they advise that the effects of such works do not appear to have been scoped. The development proposal appears to connect to public foul system at Llantwit Major STW (which will require an extension). **The effects of any new infrastructure works should therefore be included as part of the EIA process**.

Dwr Cymru/ Welsh Water also advise that there should be a specific section on **Water Quality**, and suggest adding it to the Hydrology section. This section should include the discharge from Llantwit Major WwTW and raw water extraction. Also it is understood that the development will require a foul water sewage pumping station to drain the site, this being the case it will need to be assessed to determine any potential impact on the environment e.g. odour issue, emergency over flow and noise. They also advise that the table under Section 3.10 of page 47 may have a bearing on raw water extraction.

With respect to section 3.12 table headed “Hydrology and Flood Risk” (p50) they suggest the words in bold below should be added to this paragraph:

“The quality and quantity of all site discharge and quantities will be subject to a modification to the discharge consent which will be agreed with the EA prior to **design and** construction.”

They also advise that during the construction period the foul flows from St. Athan to the Aberthaw WwTW need to be restricted to existing level.

- Landscape Appraisal and Visual Impact

  The nature and scope of the proposed Landscape Appraisal and Visual Impact elements of the report are noted and accepted.

  DCWW advise that the visual impact of the Llantwit Major WwTW extension has not been mentioned and that particular emphasis will be placed on the WwTW in line with any previous considerations taken into account for this site (p. 53 - *Section 3.10.2).*

- Noise and Vibration

  The EHO is satisfied with the scoping request and the forward actions proposed for the EIA with regard to Noise.

In relation to the noise implications DCWW state that these will need to be fully investigated to ensure no detriment to the environment.

- Traffic and Transport

  The Head of Visible Services (highways) recognises that the construction processes and eventual use of the development proposals for the DTA are somewhat fluid at present – a factor that the scoping document duly recognises. They therefore consider that the content of the document is drawn sufficiently widely to cover the eventualities that are presently being made known.

  They do, however, make some specific comments (see Appendix D) relating to the speculative nature of highway improvements at present; the need to consider proposed (and possible?) future developments outside the VoG; and the absence of submissions to date relating to the required Traffic Assessment, noting that the June 2006 version was somewhat lacking in detail for a development of this magnitude, and that a December 2006 version has not been supplied to date.

- Water

  DCWW have also made comments with regard to the clean water supply to the site, noting that given the current condition of the local infrastructure and the likely increase in the demand, it is highly likely that reinforcement works will be required. Consequently, if works are identified to be carried out, additional construction works will be required which may not be covered by the current extent of the environmental scope.

  In the absence of details of such works, however, DCWW cannot comment on their recommendations as to how the scoping report should be amended to reflect them. Accordingly, they suggest that a section be included that highlights this in the event works are required, their effects on the environment should be considered in full.

- Waste

  The EAW note the comments made in paragraph 2.3.4 with regard to waste management disposal, and confirm that Site Waste Management Plans will be required and welcome consultation in this regard. The development proposals should also encourage waste minimisation at source and reuse/recycle of waste material is to be encouraged on site rather than off-site.

<u>CONCLUSION</u>

On the basis of the above, it is concluded that the extensive submissions have largely covered all elements expected to be covered in the Environmental Statement, but that the report above and the full comments in the appendices should be forwarded to the applicant to inform of the need for additional work as outlined in the representations.

RECOMMENDATION – OFFICER DELEGATED

Environmental Impact Assessment submitted should cover the matters referred to in Schedule 4 of the Town and Country Planning (Environmental Impact Assessment((England and Wales) Regulations 1999, as referred to in the information details as submitted with the request but should also include an assessment of the following:

1. That the applicants be advised that, in addition to the scope of the Environmental Statement (ES) identified in the supporting submissions, that the proposed ES cover those matters raised in the report above, with particular respect to the extensive comments of the Environment Agency, CCW and Welsh Water and the highway engineers concerning the required Traffic Assessment.

NOTE:

Please note that this consent is specific to the plans and particulars approved as part of the application. Any departure from the approved plans will constitute unauthorised development and may be liable to enforcement action. You (or any subsequent developer) should advise the Council of any actual or proposed variations from the approved plans immediately so that you can be advised how to best resolve the matter.

In addition, any conditions that the Council has imposed on this consent will be listed above and should be read carefully. It is your (or any subsequent developers) responsibility to ensure that the terms of all conditions are met in full at the appropriate time (as outlined in the specific condition).

The commencement of development without firstly meeting in full the terms of any conditions that require the submission of details prior to the commencement of development will constitute unauthorised development. This will necessitate the submission of a further application to retain the unauthorised development and may render you liable to formal enforcement action.

Failure on the part of the developer to observe the requirements of any other conditions could result in the Council pursuing formal enforcement action in the form of a Breach of Condition Notice.

2008/00877/SC2 - APPENDIX A

Mr S Ball
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CF63 4RT

Ein cyf/Our ref: SE/2008/107261/01-L01
Eich cyf/Your ref:
P/DC/SJB/2008/00877/SC2

Dyddiad/Date: 04 August 2008

Annwyl Mr Ball / Dear Mr Ball

SCOPING REQUEST - REDEVELOPMENT OF MOD ST ATHAN AS DEFENCE TECHNICAL ACADEMY (DTA) AND AEROSPACE BUSINESS PARK (ABP). ST ATHAN.

We refer to your letter dated 11 July 2008, enclosing a formal Scoping Opinion consultation and the following report;

- "St Athan – Home of the Defence Technical Academy and Aerospace Park". (27 June 2008). Prepared by Entec UK Ltd.

We provide the following advice;

The Scoping Report appears to be comprehensive in scoping those issues to be included as part of the Environmental Impact Assessment (EIA) process. Overall, we agree with the topics included in Table 1.1 for inclusion in the EIA, although it is not clear to us whether the effects relating to new foul sewerage infrastructure are also being considered. We also confirm that the EIA will need to consider direct, indirect, cumulative, short, medium, long-term, permanent, temporary, positive and negative effects, including their inter-relationship.

Schedule 4 of the Town and County Planning (Environmental Impact Assessment) (England and Wales Regulations) Regulations 1999 (SI No. 293) also comments that an outline of the main alternatives, reasons for choice, taking account the environmental effects should be considered. We suggest that this aspect should also be considered as part of the EIA.

We wish to provide the following advice in relation to the scoped topics;

Flood Risk, Surface water, Development Control matters
Section 3.9 of the report, dealing with Hydrology also describes issues relating to surface water features and flood risk. Table 3.12 sets out the proposed scope of further assessments including flood risk and surface water drainage.

The report comments that there are no development advice map zones (Technical Advice Note 15 Development and Flood Risk July 2004 (TAN15)) along the Boverton Brook. This is incorrect because there are areas of zones C2 and B along both the Boverton Brook and the Llanmaes Brook.

As part of any planning application potentially impacting on flood risk in the area, a full flood consequences assessment (FCA) will be required in line with Appendix 1 of TAN15. In order to establish existing and post-development flood risks and consequences it is likely that the applicant will need to carry out, submit and agree a hydraulic modelling of the relevant watercourses. It is particularly important to establish that there is no increased flood risk to existing property in the Boverton Brook catchment considering the history of flooding. The report refers to the latest climate change guidance from Department for the Environment, Food & Rural Affairs (Defra) and which requires a factor for climate change to be applied over a 50 year lifetime of development. It is possible, however, that for dwellings the lifetime to be considered will increase (in the near future) to a more realistic 100 years and we recommend that this scenario is also considered within the assessment.

With regard to surface water drainage from the site, TAN15 requires Sustainable Urban Drainage Systems (SUDS) to be utilised wherever possible. Where a conventional drainage system is proposed then we would expect justification and reasoning to be provided by the applicant as to why SUDS are not appropriate. Any conventional system should improve on the status quo.

We note that within Section 3.9.2 a Drainage Strategy will be prepared, which will feed into an FCA, which will also support the EIA. In respect of attenuation requirements, Greenfield run-off figures have been recalculated for the Boverton Brook catchment. We advise therefore that the runoff from the site should not normally exceed 3.9 litres/sec/hectare (whole site). The minimum storage requirement (including an allowance for climate change) is 470 cubic meters per hectare of impermeable surface. Please note that these figures may be subject of future changes when better flood estimation methods and data becomes available.

Other regulatory requirements
We advise the applicant of the following flood consenting requirements.

Part of the proposed development site drains to the Boverton Brook which, along with it's tributary Llanmaes Brook, is designated as a statutory Main River in the vicinity of the site. A Flood Defence Consent from Environment Agency Wales, under Section 109 of the Water Resources Act 1991, will be required for works in, under or over any Main River. In addition a Flood Defence Consent, under Agency Byelaws, may be required for works within 7metres of the top of the banks of a Main River or from the landward toe of any flood defence structure. If there are any other watercourses on the site then a Flood Defence Consent will be required, under Section 23 of the Land Drainage Act 1991, for any works likely to affect the flow.

Cont/d..

Water Resources
The scoping opinion request does not state whether any water abstraction will be required for the construction or operating of St Athan DTA and ABP.

Other regulatory requirements
Please be advised that an abstraction licence (No. 21/58/21/0029) for site remediation at St Athan was issued by us in 2007. It is unknown whether any further abstraction will be required. We request clarification in this regard. If any further abstraction above 20 cubic metres per day is required, then please contact Rebecca Rowlands, Senior Environmental Planning Officer (Tel. 02920 245109) to discuss this matter further.

Biodiversity Matters
Section 3.8.2 discusses which receptors are considered to be valuable ecologically. With respect to habitats, those that are designated, rare or support valuable species should also be considered valuable. With respect to species we believe that water vole should be considered a valued ecological receptor. This species is in decline, protected by the Wildlife and Countryside Act and a priority Biodiversity Action Plan (BAP) species. We would also recommend that (given their legal and/or declining status) further advice is sought on the need to elevate badgers and reptiles to 'valued ecological receptor' status.

We note that all species and habitats that are not noted as 'valuable' are automatically considered 'not valuable'. During the detailed survey stage, species of conservation importance may be recorded whose presence had not previously been considered likely. It is important that there is a mechanism by which these species can be added to the 'valuable ecological receptor list', even if nominally they would fall into the 'not valuable' list.

In reference to Section 3.8.3, it seems that for an effect to be considered negative, the magnitude of the impact must be large (that is, affecting the long term survival of the species/ habitat). Conversely, to be considered positive, an effect can be quite small (for example, the receptor to become valued at a higher level). Cumulative impacts should be considered when assessing negative effects.

The approach taken (Appendix E) is to consider species/habitats of district or local value as non valuable ecological receptors. We are of the opinion that these should be considered valuable. If the approach taken by all developers was to consider habitats/species of local and district importance as non valuable, cumulative losses would be significant and the status of these receptors would soon be elevated. In our opinion, it is not acceptable to wait for this to happen before considering the need to mitigate impacts.

Other comments
In line with Welsh Assembly Government and UK Government expectations, enhancement opportunities should be sought as part of this development so that there is no net loss (and preferably gain) in terms of biodiversity value. We would expect all watercourses on site to be protected by a buffer strip at least 5m wide.

Cont/d..

Groundwater and Contaminated Land Matters
The Scoping Report identifies that historic contamination is present at the site and subject to an ongoing programme of remedial works, with Table 3.4 setting out the next steps of the EIA process to assess the effects of the proposed development during construction and in the long term on residual contamination and ongoing natural attenuation. We confirm the need for this.

We would also comment that in this Table 3.4, although reference is made to the possibility of dewatering during construction and the effect this could have on groundwater levels and baseflow contribution to local watercourse, it should additionally consider the location of any zones of dewatering relative to areas of residual groundwater contamination and programmes of monitored natural attenuation. Any poor quality water drawn in by dewatering would need to be appropriately treated and/or disposed of at an authorised facility, whilst any effects on the remedial programme would also need to be monitored and mitigated as necessary.

Furthermore, whilst the site has been subject to investigation and remediation work, it would nonetheless be advisable for the Site Environmental Management Plan (SEMP) or similar to include contingency measures to be followed in the event of any previously unidentified contamination being encountered during the redevelopment phase.

Likewise, if, in the adoption of SUDS for surface water drainage at the site, there are likely to be infiltration techniques or elements of soakage into the ground, these will need to be located so as to avoid mobilisation of residual contamination.

Water Quality Matters
Again from a water quality perspective we encourage sustainable drainages systems to be incorporated as far as possible, in the interests of reducing pollution. We would expect measures to be implemented to ensure no derogation of water quality and where possible improvements. The extent and nature of pollution prevention measures will need to be detailed in the ES to provide sufficient assurance that potential and direct effects on water quality can be mitigated.

In respect of Off-site Sewage Treatment Works and Drainage works, the effects of such works do not appear to have been scoped? The development proposal appears to connect to public foul system at Llantwit Major STW (which will require an extension). The effects of any new infrastructure works should be included as part of the EIA process.

We would also expect details of foul drainage proposals to be included as part of the planning application submission demonstrating that such works are suitable for the proposed development, with any necessary agreements in place. This is to ensure that any significant environmental and amenity problems which might justify refusal of planning permission are unlikely to arise.

<u>Other regulatory requirements</u>
A variation to Discharge Consent will be required in respect of Dwr Cymru Welsh Water's (DCWW) consent for Llantwit Major Waste Water Treatment Works to reflect the increased flows. Please also be advised that any Sewage Pumping Station(s) that will be necessitated at the site to convey flows to the Waste Water Treatment

Cont/d..

Work(s) may well become adopted by DCWW, and have emergency overflows (EOs). These will also require an application for discharge consent to be submitted.

In reference to discharges to ground or watercourse (not including clean uncontaminated rainwater) we advise that any discharges of site drainage or effluent will require Consent to discharge if pollution can be controlled. Otherwise the discharge will be prohibited and local conditions will dictate).

Waste

We note the comments made in paragraph 2.3.4 with regard to waste management disposal. We confirm that Site Waste Management Plans will be required and welcome consultation in this regard. The development proposals should also encourage waste minimisation at source and reuse/recycle of waste material is to be encouraged on site rather than off-site.

Other Regulatory Requirements

In respect of waste activities, disposal, storage and beneficial use are covered by the Environmental Permitting Regulations and Duty of Care Regulations 1991. These are standard permits for certain low risk waste facilities (waste transfer, treatment and storage); Schedule 1 Part 2 describes other waste facilities (landfill, incineration). Schedule 3 describes certain exemptions for storage and use of waste.

PIR

Section 3.6.2 of the Scoping Report in respect of air quality baseline conditions does not consider the impact of the proposed energy centre on emissions to air. Depending on its size there may be an impact on NOx levels.

Other Regulatory Requirements

We also advise that if the CHP within the energy plant is of significant size then a permit may be necessary with Environment Agency Wales or the Local Authority.

Where any new consent/permit or a variation to an existing authorisation is sought from the Environment Agency, approaching us for advice at the earliest opportunity is encouraged. These application processes may have implications to the applicant's proposed timescales and programmes for construction. It may necessary to review any existing consents and the applicant will at least have to ensure that compliance with those consents is feasible.

We trust the above comments are helpful as more detailed proposals become available then we would wish to be consulted further, and we may wish revise our advice/comments accordingly.

Cont/d..

Should you wish to discuss the above comments or proposed development, please do not hesitate to contact the undersigned in the first instance.

Yn ddiffuant / Yours sincerely

Mrs Jackie Walters
Technical Specialist Planning Liaison

Deialu uniongyrchol/Direct dial 029 2024 5183
E-bost uniongyrchol/Direct e-mail jackie.walters@environment-agency.gov.uk

End

APPENDIX B
(Welsh Water)

Vale of Glamorgan Council
Dock Office
Barry Docks
Barry
CF63 4RT

Your ref: P/DC/SJB/2008/00877/SC2
Our ref: NE02617/MDE/VOG/20
Enquiries: Maria Evans
Direct Line: (01443) 331123

For the Attention of Mr S Ball

11 August 2008

Dear Sir

Re: Redevelopment of MoD St. Athan as a Defence Technical Academy (DTA) and Aerospace Business Park (ABP) – Environmental Impact Assessment (EIA) Scoping Report

Further to your letter dated 11 July 2008, we agree in principle to the Environmental Impact Assessment Scoping Report, however we wish to raise the following points:

Sewerage

Page 29 – *Section 3.6 Table headed "Next steps in the EIA process"*
To address any local issues that may arise we suggest taking actual odour readings from our Llantwit Major (WwTW) rather than relying on old information.

Page 45 – *Section 3.9 Hydrology*

We would like to see a specific section on Water Quality and suggest adding it to the Hydrology section.

This section should include the discharge from Llantwit Major WwTW and raw water extraction. Also it is understood that the development will require a foul water sewage pumping station to drain the site, this being the case it will need to be assessed to determine any potential impact on the environment e.g. odour issue, emergency over flow and noise.

The table under Section 3.10 of page 47 may have a bearing on raw water extraction.

Page 50 – *Section 3.12 table headed "Hydrology and Flood Risk"*
We suggest the words in bold below should be added to this paragraph:

"The quality and quantity of all site discharge and quantities will be subject to a modification to the discharge consent which will be agreed with the EA prior to **design and** construction."

We also advise that during the construction period the foul flows from St. Athan to the Aberthaw WwTW need to be restricted to existing level.

Page 53 - *Section 3.10.2*
We would also comment that the visual impact of the Llantwit Major WwTW extension has not been mentioned and that particular emphasis will be placed on the WwTW in line with any previous considerations taken into account for this site.

Page 65
In relation to the noise implications these will need to be fully investigated to ensure no detriment to the environment.

Water

With regards to the clean water supply to the site, we would like to comment as follows.

As you may be aware there is an existing supply serving the site, however, this supply will need to be increased prior to the redevelopment of the site. Given the current condition of the local infrastructure and the likely increase in the demand, it is highly likely that reinforcement works will be required. Consequently, if works are identified to be carried out, additional construction works will be required which may not be covered by the current extent of the environmental scope. At this moment in time we do not know what the extent of any works are, therefore, we cannot recommend how the scoping report should be amended to reflect them. We would suggest that a section be included that highlights this in the event works are required, their effects on the environment should be considered in full.

We hope the above is sufficient for your purposes, however, should you require further assistance please contact us.

Yours faithfully

Maria Evans
Network Development Consultants

APPENDIX C

cwlfly.com

CARDIFF INTERNATIONAL AIRPORT LTD.

Vale of Glamorgan, Wales CF62 3BD
Tel. 01446 711 111 Fax. 01446 712 555
www.cwlfly.com

Mr S. J. Ball
Planning and Transport
The Vale of Glamorgan Council
Dock Office
Barry Docks
Barry
CF63 4RT

1st August 2008

Your ref. P/DC/SJB/2008/00877/SC2

Our Ref. 2008/0034

SCOPING REQUEST – REDEVELOPMENT OF MOD ST ATHAN AS A DEFENCE TECHNICAL ACADEMY (DTA) AND AEROSPACE BUSINESS PARK (ABP)

Dear Mr Ball

Thank you for your letter dated 11th July 2008 and the accompanying Environmental Impact Assessment Scoping Report. As you are probably aware, the Airport Company has a duty to monitor and safeguard an area around the airfield of a 13 Km radius. The aim of safeguarding is to prevent: obstacles penetrating aircraft airspace, buildings / structures causing interference with instrument landing systems, navigational aids and radar, lighting causing confusion for pilots and any development that may increase a bird hazard.

As this proposal is approximately 6Km from Cardiff Airport, it is unlikely that the aircraft airspace will be penetrated. However, the operation of cranes within a 6 Km radius is subject to approval by the Airport operator.

With regards to interference with instrument landing systems, navigational aids and radar, this can be caused by the use of reflective type building materials, metal structures and equipment that can cause electromagnetic changes to radio signals. We would require to be consulted at the planning application stage, where a more detailed assessment of hazards can be made.

The airport would require site access, day and night during the construction phase, for its staff to enable any bird activity to be monitored and if required, in the interest of aircraft safety, dealt with accordingly.

Yours Sincerely
for Russ Clements, Head of Operations

David P Shire

APPENDIX D

Ball, Steve J

From: Hodge, Tony
Sent: 06 August 2008 13:19
To: Ball, Steve J
Cc: Gay, Paul; Bevan, Tom F
Subject: FW: DTA St Athan - Response to Entec EIA Scoping Statement - Traffic and Transportation

Steve – (thought that I'd sent this – if not – then apologies)

I refer to your memo dated 11th July in which you ask for comments on Entec's scoping document dated 27th June.

It is recognised that the construction processes and eventual use of the development proposals for the DTA are somewhat fluid at present – a factor that the scoping document duly recognises.

Thus the content of the document is drawn sufficiently widely to cover the eventualities that are presently being made known to us.

I have noted the following specific matters

(1) **3.3 – Cumulative Effects & Appendix G – Page G1** - Reference is made to WAG proposals to trunk the A48 and A4226 leading to the airport and a link road from M4 to CIA. These are speculative statements considering the progress of the ongoing Arup studies for the WAG. In addition, the final paragraph of this section needs consider proposed (and possible?) future developments outside the VoG

(2) **3.12.1 & Appendix G – Page G1** - Reference is made is to Capita Symonds having prepared a TA dated Dec 2006. I am not aware that this has been made available to us (enquiries to Capita were also vague on this matter). We have a version dated June 2006 which we felt was somewhat lacking in detail for a development of this magnitude. Therefore this is a matter to watch in due course when the development proposals are in a more advanced state.

Tony Hodge
Group Engineer - Highway Projects & Traffic Management,
Vale of Glamorgan Council
Phone 029 2067 3142 Fax 029 2067 3175

Appendix E

MEMORANDUM / COFNOD

VALE of GLAMORGAN
BRO MORGANNWG

The Vale of Glamorgan Council
Public Protection Services
Legal, Public Protection and Housing Services Directorate
Civic Offices, Holton Road
BARRY, CF63 4RU

To:	Mr Steve Ball
Dept / Adran:	
Date/Dyddiad	28th July 2008
Your Ref / Eich Cyf:	P/DC/SJB/08/00828

From / Oddi Wrth:	Kristian D James Pollution Section
My Ref/Cyf	KDJ/225323
Tel / Ffôn:	01446 709105
Fax / Ffacs:	01446 709449

Subject / Testyn: **Re: Planning Application No - 08/00877/SC2**
MoD St Athan, Royal Air Force, Cowbridge Road, St Athan, . CF62 4WA
Scoping request - redevelopment of MoD St.Athan as a Defence Technical Academy (DTA) and Aerospace Business Park

I refer to your memorandum received by this department on 18th July 2008, this department has Comments to make regarding the above application

We are satisfied with the scoping request and the forward actions proposed for the EIA with regard to

Noise .
Air Quality (see below)
Contaminated Land

Observations

CHP plant

The presence of a combined heat and power plant may impact upon air quality. A stand alone permit will be required for this installation. However its contribution to local air quality must be considered in the context of the EIA

Lighting
With some exceptions external lighting may impact upon residential amenity (also can be subject of statutory nuisance. Schemes should take into account the ILE code for avoidance of obtrusive light

Kristian D James
Team Leader, Env Health (Pollution)

APPENDIX 'F'

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

CADEIRYDD/CHAIRMAN: JOHN LLOYD JONES OBE
PRIF WEITHREDWR/CHIEF EXECUTIVE: ROGER THOMAS

Anfonwch eich ateb at/Please reply to: Scott Hand
Ffôn/Tel: 029 20 772400
Ffacs/Fax: 7 Castleton Court - 029 20 772412
Ebost/Email: s.hand@ccw.gov.uk

Rhanbarth De a Dwyrain / South & East Region
7 Cwrt Castleton / 7 Castleton Court
Ffordd Fortran / Fortran Road
Llaneirwg / St Mellons
CAERDYDD / CARDIFF
CF3 0LT

Mr S J Ball
The Vale of Glamorgan Council Dock Office
Dock Offices, Barry Dock
Barry
CF63 4RT

Ein cyf/Our ref:C.09.96.06/SOH/JH

7 August 2008

Dear Mr Ball

TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED)
APPLICATION NO: 2008/00877/SC2
PROPOSAL: SCOPING REQUEST – REDEVELOPMENT OF MOD ST. ATHAN AS A DEFENCE TECHNICAL ACADEMY (DTA) AND AEROSPACE BUSINESS PARK (ABP)
LOCATION: ST ATHAN
GRID REFERENCE (E) 300175 (N) 168706

Thank you for giving CCW the opportunity to comment on the above scoping request.

In general, CCW welcomes and supports the scoping document and we welcome the work which has been carried out to date and the proposals for further assessment work, particularly on populations of European Protected Species known to occur on site (great crested newts, bats and otters). We look forward to continuing to work closely with the applicant and their agents to ensure these species are adequately considered within the EIA and application process. However we do have one or two comments to make.

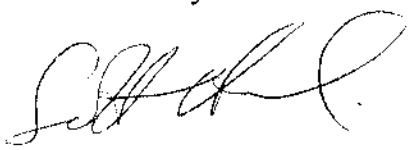
We note the methodology for identifying valued ecological receptors outlined in Box E1 (pgE7), however we have some concerns in relation to certain judgements that are then made on this basis. For instance, although we accept from previous survey results the likelihood of them occurring on site is small, we do not consider that water vole should be considered as a non valuable receptor, particularly given their status in the United Kingdom Biodiversity Action Plan (UKBAP), and their well documented and dramatic decline over the last 20yrs. Any population of water vole regardless of size should be considered as significant.

The overall approach which suggests impacts on any population of species judged to be of district value or less cannot be considered as significant may not be appropriate and given your general duty to have regard to conserving biodiversity, as set out in section 40 of the Natural Environment and Rural Communities (NERC) Act (2006).

We recommend that you speak to your Authority's Ecologist regarding the status of locally important biodiversity features and the need to assess the impacts of the proposals upon them.

We hope that these comments are helpful to you. However, should you have any queries, please don't hesitate to contact me.

Yours sincerely



Scott Hand
Senior Conservation Officer
Vale and Valleys Team

APPENDIX 'G'

GLAMORGAN GWENT ARCHAEOLOGICAL TRUST LTD

Curatorial Division

Our ref: VOG0843/CNM

CURATORIAL DIVISION

Head of Planning and Transportation
The Vale of Glamorgan Council
Dock Office
Barry Docks
BARRY
CF63 4RT

28th July 2008

FAO Steve Ball

Dear Sir

Re: Town and Country Planning (Environmental Impact Assessment) (England And Wales) Regulations 1999
Proposed Mixed Use Development
Defence Technical Academy and Aerospace Park
MOD St. Athan

Thank you for your letter of the 16th July requesting our advice in regard to the scoping document for the above proposed development. Subsequently to your letter we have received a copy of the report directly from Entec.

We have read section 3.7 *Cultural Heritage* and Appendix D *Approach to Cultural Heritage Assessment* of the scoping report with great interest. The proposed methodology for assessing the impact of the proposed development on the cultural and archaeological resource is logical and meets current professional standards. Consequently, in our role as the archaeological advisors to your Members, we can advise you that the work outlined in the scoping report to assess the impact of the proposed development on the cultural heritage is appropriate and recommend that you accept this section of the proposed assessment.

Thank you for consulting us on this scoping exercise. If you or the applicants have any questions or require further advice please do not hesitate to contact us.

Yours faithfully

Neil Maylan BA MIFA
Archaeological Planning Manager

HERITAGE IN BRITAIN AWARD

IFA
Registered Organisation

Glamorgan-Gwent Archaeological Trust Limited
Heathfield House
Heathfield
Swansea SA1 6EL
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Fax: (01792) 474469
www.ggat.org.uk
email: curatorial@ggat.org.uk

Registered Office: As above
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Registered Charity No. 505609

VGC Ecology Comments - Appendix H

Comments following submission of EIA scoping report on St. Athan – prepared by Entec Ltd (received 16 July 2008)

Habitat assessment

It is recommended that an assessment be carried out on the effects on habitat surrounding the Waycock Cross junction. CCW Phase 1 survey work identifies unimproved grassland adjacent to the Waycock Cross junction.

Water vole

The biodiversity evaluation does not identify water vole as a valued ecological receptor (value is judged as district level only). It is noted that water vole are unlikely to be present on site. However, given national declines in the species and that no populations are known to survive in the Vale, it is recommended that water vole be considered a valued ecological receptor.

It is noted that survey-work is ongoing to confirm presence/absence due to the species' legal protection.

APPENDIX 'I'(1)

Cadw

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Ffôn 01443 33 6000 Ffacs 01443 33 6082
Ebost cadw@wales.gsi.gov.uk
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Parc Nantgarw,Cardiff CF15 7QQ
Tel 01443 33 6000 Fax 01443 33 6082
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Web www.cadw.wales.gov.uk

RECEIVED
24 JUL 2008
ENTEC

Ms Claire Cable
Entec UK Ltd
Pacific House
Imperial Way
Reading
RG2 0TD

Eich cyfeirnod Your reference	
Ein cyfeirnod Our reference	A-CAM011-09-QA703475/1
Dyddiad Date	22 July 2008
Llinell uniongyrchol Direct line	01443 336097
Ebost Email:	Heather.Bassett-Jones@Wales.gsi.gov.uk

Dear Ms Cable

ENVIRONMENTAL IMPACT ASSESSMENT SCOPING REPORT – ST ATHAN – HOME OF THE DEFENCE TECHNICAL ACADEMY AND AEROSPACE PARK

Thank you for sending our Assistant Regional Inspector of Ancient Monuments, Jonathan Berry, a copy of the above report which we received on 16 July 2008. Mr Berry has now had chance to consider this report and has made a number of comments as follows:

The chapter on cultural heritage (3.7) is adequate and accurate, although it is noted that:

- neither Cadw nor the Historic Environment Record held by the Royal Commission on the Ancient Historical Monuments of Wales were consulted by Cotswold Archaeology during their Desk Based Assessment;
- the scheduled ancient monuments listed on page 31 is incomplete, omitting East Orchard Wood Pillbox (GM598) and Limpert Bay Anti-invasion Defences (GM601), both of which are new schedulings.
- It is understood that you are aware of proposed scheduling activity relating to RAF St Athan's ground perimeter defences.

Cadw is content that the identification of the next steps in the assessment process is in accordance with expected standards and guidelines.

Please quote the above reference in any correspondence with Cadw.

Yours sincerely,

Heather Bassett-Jones.

Mrs Heather Bassett-Jones
Gweinyddu Henebion / Ancient Monuments Administration

Cadw yw gwasanaeth amgylchedd hanesyddol Llywodraeth Cynulliad Cymru. Ein nod yw hyrwyddo gwaith cadwraeth ar gyfer amgylchedd hanesyddol Cymru a gwerthfawrogiad ohono.

Cadw is the Welsh Assembly Government's historic environment service. Our aim is to promote the conservation and appreciation of Wales's historic environment.

BUDDSODDWR MEWN POBL
INVESTOR IN PEOPLE

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

CADW Scheduled Ancient Monument Record
Core SAM Information

SAM No: GM601(GLA)	AI No: 7	File No: 7960	Schedule Ref: 21/7960/GM601(GLA)//

SAM Name: Limpert Bay Anti-invasion Defences

	Traditional	Qualifier	NGR-X	NGR-Y	Scheduled:
NGR	ST013664	100	301340	166418	Yes

	1:50, 000	1:10, 000	1:2, 500
Primary	170	ST 06 NE	ST0166
Additional			

Unitary Authority(UA):	Community:
The Vale of Glamorgan	St Athan
The Vale of Glamorgan	Llantwit Major

Area(Ha): 0.71	Primary Class: Medieval and Post Medieval Secular
	Additional Class:

Summary:

CADW Scheduled Ancient Monument Record
Core SAM Information

SAM No: GM598(GLA)	AI No: 1	File No: 7950	Schedule Ref: 21/7950/GM598(GLA)//

SAM Name: East Orchard Wood Pillbox

	Traditional	Qualifier	NGR-X	NGR-Y	Scheduled:
NGR	ST028676	100	302892	167660	Yes

	1:50, 000	1:10, 000	1:2, 500
Primary	170	ST06NW	ST0267
Additional			

Unitary Authority(UA): The Vale of Glamorgan

Community: St Athan

Area(Ha): 0.01

Primary Class: Medieval and Post Medieval Secular

Additional Class:

Summary:

[redacted] Appendix 'I' (ii)

Ball, Steve J

From: Bailey, Nicky (DE&T) [Nicky.Bailey@Wales.GSI.Gov.UK]
Sent: 29 July 2008 17:12
To: cablc@entecuk.co.uk; sjball@valeofglamorgan.gov.uk; Bassett-Jones, Heather (DH - CADW)
Cc: Swallow, David (DE&T - PSCS); Bampton, Ed (DE&T - Ops SE & Infra); George, David (DE&T - PSCS); Volausek, Pam (DE&T - PSCS); paul.vining@wyg.com; Hearne, Richard (DE&T); Grimmel, Mike; Hearne, Richard (DE&T)
Subject: FW: Scoping response from Cadw - Cotswold Archaeological Trust

Further to CADW's letter of comment on the Scoping Report dated 22 July 2008, please see the attached response from CAT detailing their consultation with CADW and with RCAHMW.

Regards
Nicky

Nicky Bailey
Head of Planning
Sectors and Strategic Projects
Policy Strategy and Corporate Sevices
Department for the Economy and Transport
Tel: +44 (0)7796 991256

From: paul.vining [mailto:paul.vining@wyg.com]
Sent: 29 July 2008 16:59
To: Bailey, Nicky (DE&T)
Cc: Bampton, Ed (DE&T - Ops SE & Infra); Swallow, David (DE&T - PSCS); George, David (DE&T - PSCS); Volausek, Pam (DE&T - PSCS); Hearne, Richard (DE&T)
Subject: FW: Scoping response from Cadw

Dear Nicky

Further to your enquiry earlier today, please see the detailed response below from Richard Morton of Cotswold Archaeology. You might wish to inform Cadw of this.

Regards

Paul Vining
Director
Planning

WHITE YOUNG GREEN
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www.wyg.com

Wr Lr Young Green Consulting Limited. Registered in England number: 1959704 Registered Office: Arncale Court, Otley Road, Headingley, Leeds, West Yorkshire LS6 2UJ VAT No. 431 0326 08

From: Richard Morton [mailto:Richard.Morton@cotswoldarch.org.uk]
Sent: 29 July 2008 14:16
To: paul.vining
Subject: RE: Scoping response from Cadw

Dear Paul,
Thanks for the Cadw comments. To deal with each in turn:

- Yes indeed, as pages 6-7 of our report states both Cadw and RCAHMW were consulted. Cadw provided paper mapping and site details for the original assessment in 2001, and provided digitally updated data as shapefiles which were received on 4th September 2007. The RCAHMW Aberystwyth offices were visited and their archaeology archive and air photos examined by us on 20th Nov 2007. It clearly says this on page 7 of our report!
- Cadw say in their comments that these two defensive sites are new Schedulings, and they have certainly been added subsequent to our report. In fact, we receive new digital data for all SAMs in Wales from Cadw every 6 months (last received 18th July 2008) and the sites are not even on that data set.

I'm glad that the report itself is found acceptable by Cadw. I am happy for you to pass my comments above on to necessary parties. If Entec would like the report updating to include the 2 new SAMs, I'm sure we could oblige.

Best wishes

Richard

From: paul.vining [mailto:paul.vining@wyg.com]
Sent: 29 July 2008 12:43
To: Richard Morton
Subject: FW: Scoping response from Cadw

Dear Richard

St Athan

Entec have now prepared an ES scoping report for the overall development and were given access to the report that you prepared in December 2007 (report no. 07178). Attached you will find Cadw's comments on the scoping report and, below, an e-mail from our client (WAG). Can you please comment on the first two items:

- Your report clearly indicates that you did consult both Cadw and RCAHMW. Can you please supply details?
- I imagine that the two new schedulings post-date your report. Can you please confirm?

Regards

Paul Vining
Director
Planning
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White Young Green Consulting Limited. Registered in England number. 1959704 Registered Office: Arndale Court, Otley Road, Headingley, Leeds, West Yorkshire LS6 2UJ VAT No: 431 0326 08

From: Bailey, Nicky (DE&T) [mailto:Nicky.Bailey@Wales.GSI.Gov.UK]
Sent: 29 July 2008 12:13
To: paul.vining
Cc: Bampton, Ed (DE&T - Ops SE & Infra); Swallow, David (DE&T - PSCS); George, David (DE&T - PSCS); Volausek, Pam (DE&T - PSCS); Hearne, Richard (DE&T)
Subject: FW: Scoping response from Cadw

Paul
Could you ask CAT to comment on the contents of the attached letter please.

Regards
Nicky

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Policy Strategy and Corporate Sevices
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From: cablc@entecuk.co.uk [mailto:cablc@entecuk.co.uk]
Sent: 24 July 2008 16:22
To: SJBall@valeofglamorgan.gov.uk
Cc: mike.grimmel@landsecurities.com; Bailey, Nicky (DE&T)
Subject: Scoping response from Cadw

Steve,

Please find attached letter from Cadw sent to us in response to the scoping report:

Many thanks,

Claire Cable

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Appendix B
Ecology Baseline Report

Ecology Baseline Report to come.

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Appendix C
Ecological Evaluation

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Biodiversity Evaluation

Evaluation

In order to assess the effects of any development on flora and fauna, it is necessary to define the habitat areas and species that need to be considered as part of the assessment. In identifying these resources, it is important to recognise that a development can affect flora and fauna not only within the area of land-take required for the development but also 'off-site' (e.g. noise generation on the site of the development could affect bird populations that occur off-site).

It is impractical and inappropriate for an assessment of the ecological effects of a development to consider every species and habitat that may be affected. The approach that has been taken in this ES is to identify 'valued ecological resources' (in accordance with guidelines produced by the Institute of Ecology and Environmental Management [IEEM], 2006), focusing on the ecological resources that meet one of three criteria;

- Species populations, habitats or designated nature conservation sites that are of sufficiently high value in terms of 'biodiversity conservation' (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations) that an effect upon them could be significant – in these cases, the species population/habitat/site is treated as a resource in its own right;
- Species populations, habitats or sites that provide social benefits (e.g. relating to the enjoyment of flora and fauna by the public) or economic benefits (e.g. relating to angling or other activities that make use of ecological resources) that are of sufficiently high value that the effect of an ecological change could significantly affect the social or economic benefits – in these cases, the people affected are the resource(s); and
- Legally protected species.

The approach taken in this report is that only effects on valued ecological resources may be significant, and are therefore subject to further consideration.

Biodiversity conservation

Biodiversity conservation policy focuses on protecting designated sites, and habitats and species which are rare or declining. Identification of these valued ecological resources has been made with reference to relevant site designations and lists of rare and declining species, as set out in Box 1.1.

Social and Economic Value

No ecological resources of social or economic value were identified as part of the Community Chapter 12.

Legal Protection of Species

The majority of legally protected species (see Box 1.1) are also of biodiversity conservation value, and so would be subject to assessment. However, some species are not considered to be

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valued ecological resources for biodiversity conservation, and therefore any effects on these species would not be assessed to be significant. However, it is necessary to consider how these species may be affected by the proposed development in order that measures can be taken to ensure that contravention of the relevant legislation is avoided.

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Table C1 Biodiversity Evaluation[1]

Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
Designated sites					
Internationally designated sites (SAC, SPA, Ramsar)	Habitats Directive			These sites have been designated for the internationally important ecological features they support	Yes
Nationally designed sites (SSSIs)	WaCA			These sites have been designated for the nationally important ecological features they support	Yes
Locally designated sites (cSINCs)		Local planning policy		These sites have been identified locally by the VoG as supporting habitats and species of biodiversity value. Although still candidate Sites of Importance for Nature Conservation (cSINC), Entec are still assuming that they are Valued Ecological Resources.	Yes
On-site habitats (excluding areas of cSINCs which are dealt with above)					
Amenity / improved grassland, arable, hard-standing		UKBAP LBAP (both cereal field margins)		These habitat types are extremely common nationally and in the local area. They are generally of limited value due to the high maintenance that occurs (either through mowing or agricultural practices). Whilst the UK and LBAP habitat cereal field margins	No

[1] To be read in conjunction with 'Identification of valued ecological receptors' described above.

[2] Habitats Directive - Annex IV, Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar, Wildlife and Countryside Act (W&CA) – SSSI/Sch. 1/5/8, Badgers Act.

[3] Sites of Nature Conservation Importance, BAP priority species/habitat (UK, national or local), other planning policy requirement.

[4] Habs. Dir. Annex I or II, Birds Dir. Annex I, Hedgerow Regs., Birds of Conservation Concern - Red list, Red Data Book, County red list, County notable. Other.

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
				does occur within 2km of the site (e.g. at Summerhouse Point), the margins of the arable fields within the site were not noted as supporting notable species such as shepherds needle or as being particularly species-rich in birds and invertebrates, which are characteristic of the UK and LBAP habitats. Therefore, it is considered this specific notable habitat type does not occur at the site.	
Semi-improved, poor semi-improved and marshy grassland				These habitat types within the site are relatively species-rich, but are limited in extent. They are not considered to be notable in the context of the St Athan area and are commonly found throughout Wales and the UK.	No
Semi-natural woodland (inc ancient woodland)		UKBAP		Semi-natural broad-leaved woodland occurs infrequently within the site and is generally confined to the less developed areas at the fringes (e.g. along the railway to the south of the site). Further areas of this habitat occur adjacent to the site (e.g. Oxmoor Wood). Parts of the adjacent woodland adjacent to the site are species-diverse and relate closely to the UKBAP habitat type. However within the site, the woodland is relatively species-poor, does not contain ancient woodland indicator species and is not considered to be typical of the UKBAP habitat. Nonetheless, broad-leaved woodland is an important habitat for fauna such as birds, invertebrates and mammals (e.g. dormice). Although, within the site the woodland is fragmented and often species-poor.	No
Plantation woodland				Plantation woodland occurs infrequently within the site and comprises predominantly broad-leaved species. It supports no notable plant species, but does provide habitat for fauna in locations where semi-natural habitat is limited (e.g. in the built areas). However, the areas within the site are small and poorly connected to other habitat features.	No
Hedgerows	Hedgerow Regulations	UKBAP (all hedgerows)		A total of 57 hedgerows considered to be ecologically 'important' under the hedgerow regulations are present	Yes

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
		LBAP (ancient and species-rich hedgerows)		within the site boundary. A further 24 hedgerows are considered to be species-rich but do not meet the regulation criteria for being 'important'. The hedgerows are located predominantly on the less developed land and are well connected to each other and other on-site and off-site habitats. They therefore form good habitat linkages around the site that can be used by the wide variety of fauna recorded (e.g. birds, bats, amphibians and reptiles). The value of hedgerows within the Vale of Glamorgan and the UK as biodiversity features is recognised by their inclusion on both the Local and UK BAP.	
Waterbodies		UKBAP (ponds) LBAP (eutrophic standing water)		A relatively large number of waterbodies are present within the site boundary. These vary in composition from concrete sided emergency water storage (EWS) tanks to field ponds and not all permanently hold water throughout the year (and from year to year). Nonetheless, these all meet the criteria set out for the UKBAP habitat (even the EWS, which qualify for supporting great crested newts). The network of ponds, primarily around the fringes of the site, provide a valuable wildlife corridor and resource for a variety of fauna, great crested newts in particular.	Yes
Watercourses (non-designated)		UKBAP		A small number of watercourses are present within the site boundary. The largest of these are Boverton Brook and Llanmaes Brook in the western part of the site, both of which support good bankside in and in-channel vegetation. The Nant y Stepsau is located adjacent to the north-east of the site (but is considered under cSINCs) and the larger River Thaw (and Rills Valley) lie within 500m of the site boundary to the east and south. Although small, the watercourses within the site form potentially important habitat corridors and habitat for important and protected species.	Yes
Other habitats (inc scrub, tall ruderal)				The other habitats that occur within the site are commonly found throughout Wales and the UK and are not included with the UK or local BAP or listed under Section 42 (of the NERC Act, 2006). However, they are nonetheless of some limited value to wildlife	No

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
				by providing foraging habitat and areas of cover.	
Invasive plant species	WaCA			Japanese Knotweed occurs in the vicinity of the Gileston highway improvement works. This is an invasive plant that is not native to the UK and which has very limited ecological value	No
Mammals					
Badger (*Meles meles*)	Badgers Act		Local/regional significance	Badger is known to be common in the surrounding area and is noted in the Vale of Glamorgan LBAP (2002) as being widespread. However, the site does not appear to support a large population or to be used frequently by badgers. However, badgers are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	Yes
Dormouse (*Muscardinus avellanarius*)	Habitats Directive WaCA	UKBAP LBAP NERC Act 2006		Dormouse has been confirmed as present within the site. However, only a single nest was found during the survey, suggesting that the local dormouse population occurs at very low densities (typical of dormice living in hedgerows). The national dormouse population has declined in recent years due to a number of factors (including fragmentation and habitat loss), such that populations are now generally small and scattered across southern Britain. The Vale of Glamorgan LBAP indicates that few records of dormouse exist for the Vale, but this may be due to under-recording. Notwithstanding this, the record of dormouse at the site represents a newly found population in an area where dormice are thought to be scarce and therefore the site is considered to be of value for dormouse. Dormice are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	Yes

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
Otter (*Lutra lutra*)	Habitats Directive WaCA	UKBAP LBAP NERC Act 2006		Evidence of otter has been recorded on all the main watercourses surveyed, with several potential or actual holts found, suggesting otters are common in the local area. This is reflected in the Vale of Glamorgan LBAP (published in 2002) which also highlights otters as breeding on the River Thaw and increasing generally throughout the Vale. However, the site itself contains only a small proportion of running water habitat, limited suitable holt or resting place habitat and therefore will also only form a small part of an otter territory. Nonetheless, the watercourses are connected to the River Thaw and it is probable otters will utilise the site relatively frequently despite the lack of resting places. Therefore, the site is considered to be valued for otter. Otters are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	Yes
Bats	Habitats Directive (all) WaCA (all)	UKBAP (certain species) LBAP (Pipistrelle and all bats) NERC Act 2006		A total of 24 building roosts have been confirmed within the application site supporting a range of roost types including both common pipistrelle and brown long-eared maternity roosts. At least six species have been recorded foraging and commuting within the site, including the lesser horseshoe bat which has a restricted distribution and population size within the UK. Nonetheless, only two lesser horseshoe bat passes were recorded, with the majority of bat activity comprising common species such as pipistrelle and noctule. Of the species recorded, four are listed as priority species within the UKBAP (noctule, soprano pipistrelle, brown long-eared and lesser horseshoe). All bats are listed under the LBAP. Based on the inclusion of species present within the BAPs and the	Yes

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
				legal protection afforded to bats the site is considered to by valued for this group of species. Bats are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	
Other mammals (e.g. brown hare, polecat and hedgehog)		UKBAP LBAP (brown hare only) NERC Act 2006	Local/regional significance (polecat only)	The site supports common habitat types which are likely to be used by a range of frequently found mammal species (e.g. small mammals, deer etc). Both hedgehog and polecat have been recorded at the site as incidental records, and it is possible that brown hare may also occur. Both polecat and brown hare are noted as being scarce and rare in the Vale respectively (within the LBAP). Nonetheless, the site supports areas of habitat that can be used by these notable species and is therefore of value	Yes
Herptofauna					
Great crested newt (*Triturus cristatus*)	Habitats Directive WaCA	UKBAP LBAP NERC Act 2006		Great crested newt is considered to be reasonably scarce but widespread in the VoG (from the LBAP), with at least 19 breeding sites known in 2002. At the site, great crested newt is known to occur in eight ponds, located throughout the southern areas. Relatively high numbers of great crested newt have been recorded, and numbers have remained fairly consistent over several years of survey. Given the number of great crested newt likely to occur within the site and the relatively scarcity within the Vale and Wales, the site is considered to support a population which is of value. Great crested newts are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	Yes
Other amphibians		LBAP (palmate newt)	Local/regional significance (palmate newt)	Suitable habitat for these species is limited at the site to the waterbodies (including the EWS tanks) and areas of less managed ground (e.g. rough grassland, hedgerows) and this is reflected in the unexceptional counts during surveys.	Yes

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
				Of the other amphibian species recorded at the site common frog are generally common and widespread. However, palmate newts are fairly scarce in the VoG (from LBAP) and declining nationally.	
Reptiles	WaCA	UKBAP (all species) NERC Act 2006	Local/regional significance (slow-worm, adder, grass snake and common lizard)	The site has been shown to support four species of reptile; slow-worm, common lizard, grass snake and adder. Good numbers of slow-worm have been recorded in some areas of the site and a single adder was present at Gileston (although the Aberthaw area is known to have a large population). Grass snake was recorded along the Llantwit Major pipeline route and a common lizard was seen during other surveys of the site. None of the areas surveyed would individually qualify as Key Reptile Sites (as described in Froglife, 1999), although the site as whole is likely to support an exceptional population of slow-worm and would therefore by considered to be a Key Reptile Site. The whole site would also qualify by supporting more than three species of reptile. Based on the numbers and distribution of reptiles across the site, the habitats present and the BAP status of reptiles, the site is considered to support reptile populations of value. Reptiles are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	Yes
Invertebrates					
Notable invertebrates (primarily day flying Lepidoptera, Hymenoptera and Odonata)		UKBAP NERC Act 2006	Local/regional significance (considered to be Local in Britain by LBAP)	One species listed under Section 42 of the NERC Act (2006) was recorded at the site (pearl bordered fritillary). 13 further UKBAP species were recorded (primarily moths). 11 locally notable species were found to be present including dragonflies and damselflies and grasshoppers. The butterflies, dragonflies, damselflies and grasshoppers had relatively limited distribution across the site, whereas the moths were found relatively frequently where invertebrate surveys were completed.	Yes

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
				Given the range of notable invertebrate species present across the site, the invertebrate fauna of the site is considered to be valued.	
Non-notable invertebrates				A range of non-notable invertebrates have also been recorded at the site. These are generally widespread, common species by virtue of being less habitat specific. However, invertebrates form valuable food sources for birds and other fauna and the less developed areas of the site support relatively large numbers of butterflies and moths. Nonetheless, this species have not been recognised under national or local policy and are therefore not considered to be valued in the context of the site.	No
Birds					
Breeding Schedule 1 species (Barn Owl)	WaCA	Proposed LBAP species	Welsh Birds of Conservation Concern (BOCC) amber list	One pair of barn owl was recorded breeding within the survey area (but outside the application site). This represents less than 1% of the estimated national population (of ~280) between 1992-2000 (Green, 2002). However, the Welsh Bird reports (Welsh Ornithological Society) and East Glamorgan Bird Club Reports between 2003 and 2006 indicate that between approximately seven and nine pairs have been recorded breeding in Glamorgan (but none at St Athan). Therefore one pair represents 12% of the county population. Based on this, and the greater legal protection afforded to barn owl, the site is considered to be of value for this species for foraging but not breeding. Barn owls are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	No
Other notable breeding birds	WaCA	UKBAP LBAP NERC Act 2006	Welsh Birds of Conservation Concern (BOCC) Red list	A total of four red listed species were recorded breeding within the site. Of these seven are also listed on the UKBAP, two are listed on the LBAP and eight are important under the NERC Act 2006. Given the level of protection afforded to these species, their policy status, they are considered to be valued in	Yes

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Receptor	Legal Requirements[2]	Policy Status[3]	Other Conservation Framework Relevant?[4]	Rationale	Valued Ecological Resource
				the context of the site Breeding birds are afforded legal protection and there is therefore a requirement to ensure compliance with the relevant legislation.	
Non-notable breeding birds	WaCA			The remaining bird species recorded breeding at the site are not considered to be notable. However, all breeding birds are legally protected under the Wildlife and Countryside Act (as amended, 1981) and are therefore of value within the local ecosystem as predators and prey (e.g. for birds of prey).	Yes

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Appendix D
Outline Habitat Management Plan

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Outline Habitat Management Plan

1.1 The Purpose of this Document

This outline Habitat Management Plan (hereafter referred to as the oHMP) has been produced to accompany the planning applications associated with the St Athan redevelopment. It is intended to provide assurance to the Planning Authority of the measures that will be taken during the operational stage of the development to appropriately manage habitat of importance. Specifically it provides an overview of the management techniques that will be carried out to maintain and enhance the ecological status of the area to which this plan relates, over a period of 25 years. It is proposed that a detailed Habitat Management Plan (hereafter referred to as the HMP) will be produced following approval of the planning application. Approval of the HMP will be sought from the Local Planning Authority before any works prescribed within it are commenced.

It should be noted that the proposals made are subject to safeguarding considerations and will be reviewed by the appropriate authority to gain their agreement before the content of the HMP is finalized.

1.2 Proposed period of this oHMP

The activities prescribed in this oHMP will be implemented for an initial 25 years following commencement of the construction of the development. However, the principle of managing the site ecologically through the implementation of a HMP will continue beyond these 25 years indefinitely.

It is critical that the habitat management process remains flexible throughout the 25 year period allowing there to be alterations to the activities being undertaken. This will be done primarily in response to the monitoring that is to be undertaken which will determine the status of ecological features and thus the success of the previous and current management. Therefore, the development of fixed, detailed medium or long-term targets is not desirable, rather the management prescriptions will aim to progress towards the long term vision for the site, as is detailed in Section Two.

1.3 Area covered by the oHMP

The area covered by this oHMP is that within land within the red line boundaries of the two planning applications (ABP and DTC) only.

It should be noted that the area covered by the Environmental Statement also includes the Llantwit Major rising main works which does not form part of either planning application and comprises only temporary works. The habitats disturbed by these works will be reinstated and the land then returned to the current landowners in a state similar to that now. Therefore management of this area is outside the remit of this oHMP.

1.4 Constraints

The oHMP proposals are limited to the areas of land either within the planning application boundary or upon which the applicant has an option for control, as these are the only areas in which it is considered the developer will be able to successfully influence the land management regime after planning permission is granted.

The implementation of the oHMP will not generally attract construction type effects as the works that are to be undertaken will be fairly minor in nature. However, there is some potential to affect legally protected species and Method Statements will be produced and/or licences obtained where necessary to avoid contravention of the relevant legislation.

2. Objectives and targets

2.1 Overview

The long term vision for the site, following development and implementation of the HMP, is to enhance the biodiversity value by restoring, maintaining and creating ecological features.

Based on this, the broad objectives for habitat management at this site can be split into two:

- Habitat re-creation, restoration and enhancement;
- Monitoring.

Within these broad objectives, specific targets will be set relating to the different key features (i.e. hedgerows). As there is a direct link between the quality/type of habitat and the occurrence of protected species it is considered appropriate to concentrate on managing the habitats, which will also benefit protected and otherwise important species. Where targets have been proposed specifically to benefit protected species, or where benefits to protected species may be incidental, this has been noted.

2.2 Objective 1: Habitat creation, restoration and enhancement

The baseline surveys have highlighted a number of ecological features of biodiversity importance already present within the application site that are considered to be valued, which the development will largely avoid. Much of the remainder of the site supports degraded or intensively managed habitats that offer limited habitat for flora and fauna, but which could be managed to improve their species-richness and thus their biodiversity value. Further, the landscape strategy includes the provision for additional native planting to increase the overall site resource, and this new landscaping will also require maintenance to ensure its full potential for biodiversity is reached.

2.2.1 Hedgerows

- There will be planting of native hedgerow species to infill gaps present in retained hedgerows. In addition new hedgerows will be created.
- All hedgerows will be managed by cutting on a rotational basis. Each hedgerow will be divided into three sections, and each of these sections will be cut once every three years.

This will maintain the hedgerow structure and diversity whilst also ensuring that most sections of hedgerow will always be able to fruit and flower without management intervention.

- To ensure the long-term maintenance of the hedgerows, a programme of traditional hedge-laying (using techniques appropriate to south Wales) will be implemented.

- Where hedges could be highly disturbed by operational activities they will be subject to the implementation of protection measures including, where it is appropriate, by fencing.

2.2.2 Grassland

- As a result of the development, land previously used for agriculture will be less intensively managed and encouraged to revert to more species-rich grassland containing a higher diversity of grasses, forbs and some scrub. This may require the initial intervention of a management technique specifically, such as top soil removal, to reduce the high nutrient levels that are likely to occur. Particularly this might be appropriate in areas which have been in arable crop use for some time.

- Once established small areas of new and existing, more diverse grassland will be managed through a programme of mowing, which is likely to occur in mid/late summer after grasses and herbs have set seed (such management will effectively be managing the grassland as a hay meadow). In larger areas of grassland, low intensity grazing may be possible (e.g. in St John's Valley).

- In the main the grassland within the Castleton Field Training Area, is unlikely to require extensive management as it will be fairly frequently disturbed by training activities. This should create a mosaic of tussocky grassland and bare or scarified areas of ground. Careful monitoring to ensure the value to biodiversity is maintained will be especially important in this area however.

2.2.3 Waterbodies

- The waterbodies created will require management to ensure aggressive aquatic and marginal plant species do not completely cover the pond or outcompete other species.

- When required, such aggressive plant species will be partially removed to maintain areas of open water. In doing this only a third of vegetation will be removed from a waterbody during any one season. Such management will occur in late summer to reduce potential affects on amphibians and invertebrates.

- The silting up of waterbodies will be monitored. Where water depth reduces to such an extent that the biodiversity value of a waterbody is being compromised management to remove silt will be undertaken. Again such activities should take place in the late summer to avoid affecting most significantly amphibians and invertebrates that occur.

- Where waterbodies are being specifically managed for amphibians fish should not be allowed to populate. If through monitoring activities fish are identified, consideration should be paid as to how they can be removed. It maybe that if a waterbody dries out in drier years that this will more naturally control populations. However, if a waterbody

populated by fish continually holds water other, more intensive, methods may need to be considered.

2.2.4 Watercourse corridors

- Scrub will be encouraged along the watercourses to provide habitat for flora and fauna. This will require periodic management to prevent it from encroaching over wide areas.
- If required, the watercourse channels will be cleared of extensive aquatic and marginal plant growth to preserve the flow and areas of open water.
- The silting up of watercourses will be monitored. Where water depth reduces to such an extent that the biodiversity value of a watercourse is being compromised management to remove silt will be undertaken. Such activities are likely to take place in the late summer.

2.3 Objective 2: Monitoring

Monitoring of the success of management activities is an essential components of the iterative process of long-term habitat and species management. In doing this it is important, in the first instance, that detailed baseline habitat conditions are established; this will also help to refine an appropriate scale and periodicity for monitoring and surveillance techniques. At St Athan a detailed programme of survey work has already been completed and thus the baseline against which the monitoring can take place has been established.

A detailed programme of monitoring will be drawn up as part of the detailed HMP and also to satisfy the requirements of the varying licences that are required as part of the protected species mitigation. The implementation of a monitoring programme may identify required changes to the activities as detailed within the HMP. The results of this monitoring should therefore be fed into a review programme designed to assess the progress of the implementation of the HMP and provide opportunities for the adjustment or revision of the management prescriptions (or, if appropriate, the targets). Ideally, all the goals of the scheme will be ultimately realised within the intended timescale at which point the management scheme as a whole can be appraised for its effectiveness or appropriateness.

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Appendix E
Ecology Strategy

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Defence Technical College and Aerospace Business Park - St Athan

Ecology Strategy | May 2009

CAPITA SYMONDS

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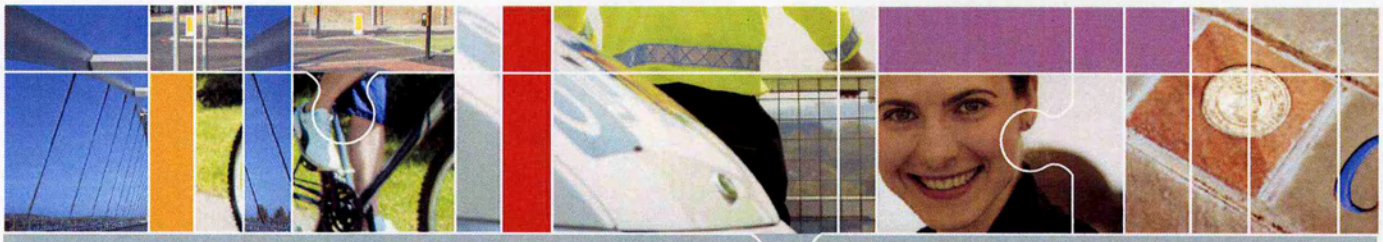

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Defence Technical College and Aerospace Business Park - St Athan

Ecology Strategy

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Issue Record

Rev	Date	Description/Comments	Author/Prepared by:	Approved for issue by:

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Appendix A Best Practice Tree Felling Protocol
Appendix B Hedgerow Translocation Method Statement

1. Introduction

Metrix and the Welsh Assembly Government are submitting planning applications for the major redevelopment of MoD St Athan in South Wales as a Defence Technical College (DTC) and Aerospace Business Park (ABP). The development site location covering the two outline planning applications is shown on Figure 1.1.

The proposed development is to cover the current military base, plus additional land either already acquired, or in the process of being acquired, by the Welsh Assembly Government around the airfield, in addition to land further away from the airfield that is required in connection with improvements to highway infrastructure.

The development proposals are based upon two main planning applications covering the following elements:

(i) A new Defence Technical College (DTC), including:
The use and extension of the existing Red Dragon Hangar for training purposes;
A new energy centre (a combined heat and power biomass plant);
Museum of military history;
Sports and recreation facilities;
A 150 key hotel;
Single living accommodation (SLA) for visiting trainees and military personnel;
Messes, training buildings, classrooms, offices, storage, workshop and other associated DTC facilities and buildings;
A Medical and Dental Centre;
A crèche and community centre;
New military church, faith centre and temple buildings;
Works associated with the arrest of the decline of the existing listed Grade II St Brise Church building and adjacent barn south of Eglwys Brewis Road;
A military Field Training Area (FTA) at Castleton, to the east of Cowbridge Road;
An external military training area, aerial farm and pole field at Picketston;
A new firing range and respirator training facility at Picketston;
External parade and training hardstanding areas;
Petrol, oil and lubrication point (POL);
A tank road within the development site parallel with the main runway;
Service Families' Accommodation (SFA) housing (with up to 483 dwellings);
Works to the existing St Athan Golf Course at Cowbridge Road, including alterations and reconfiguration to the course;
Highway works, including a new northern access road from the B4265 and improvements to the existing Eglwys Brewis Road, St Athan road junction, Waycock Cross road junction, and the B4265 road between Gileston and Old Mill;
A foul water pumping station; and.
An electricity primary sub-station.

ii. An Aerospace Business Park (ABP), including:

The erection of buildings and airfield operational facilities and structures, including an engine testing facility, hangars, offices, industrial/employment units, an extended bulk fuel store, relocated compass swing area, relocated heli-pad, relocated fire training facility, and relocated air traffic control (ATC) tower and fire station;

An Aerospace administration centre at the converted listed Grade II Batslays Farmhouse building;
The provision of access roads, hardstandings and other infrastructure, security fencing, landscaping, and all associated building and engineering operations to the north and south of the main runway;
A new southern access road from the B4265 to serve the area south of the runway;
The same highway works as for the DTC development, including a new northern access road from the B4265 and improvements to the existing Eglwys Brewis Road, St Athan road junction, Waycock Cross road junction, and the B4265 road at Gileston Old Mill; and
The same foul water pumping station as for the DTC development; and
The same electricity primary sub-station as for the DTC development.
The development at St Athan will also require the extension and upgrade of Llantwit Major Waste Water Treatment Works (WwTs) and the construction of a new rising main. These associated works do not form part of the two main outline planning applications by Metrix and the Welsh Assembly Government but have been assessed within this Environmental Statement (ES) to provide a comprehensive and complete assessment of the potential environmental effects arising as a direct result of this scheme.

2. Aims and Scope of the Strategy Report

A variety of ecological habitats and species are affected or potentially affected by the developments described in Section 1 of this report. This report should be read in conjunction with Chapter 6 of the Environmental Statement – Biodiversity and the Outline Habitat Management Plan produced for the planning application.

The overall aim of this document is to provide a cohesive strategy for ecological mitigation, enhancement of habitats for their use by faunal species and the management of habitats and ecological features for both specific mitigation and biodiversity gain.

The major objectives of the strategy therefore are to provide a framework within which:

i. The detailed ecological mitigation can be produced for the Environmental Statement;

ii. The legislative requirements in respect of species and habitats are met through design, construction methodologies and timings and specific mitigation features.

iii. Welsh Assembly Government licenses to disturb European Protected Species can be applied for, for discrete or time-bound operations, within this overall mitigation and enhancement strategy

iv. The Welsh Assembly Government and Ministry of Defence meet their obligations under the Natural Environment and Rural Communities Act (NERC) to conserve biodiversity, including the restoration and enhancement of habitats and species populations.

v. The whole development meets the aspirations of the developers – Welsh Assembly Government, Ministry of Defence and Metrix – of an exemplar scheme in terms of its mitigation for impacts upon biodiversity and the overall enhancement of the biodiversity resource within the St Athan area.

The strategy will cover the following operations over all relevant area of the proposed development(s):

- Advanced works – demolition and site clearance; 4 School of Technical Training Temporary move to southern enclave.
- Construction of the Defence Technical College and associated facilities – e.g. sports facilities and Field Training Areas (FTA)
- Site clearance and road construction and improvement.
- Demolition and construction of the Aerospace Business Park
- Construction of the Llantwit sewage pipe run.
- Operation of the above developments

- Management and monitoring of the ecological enhancement and mitigation features detailed in this report.

A further "stand-alone" version of this document, not forming part of this planning application will provide protocols and outline management procedures for general civil engineering operations undertaken over the MOD base area, including West Camp, which does not form part of either DTC or ABP planning operations.

The evaluation of the likelihood or severity of impacts upon species or habitats has been undertaken in the Environmental Statement and is not repeated here.

Some evaluation of specific ecological features such as bat roosts has inevitably been necessary in order to inform the level of mitigation and enhancement necessary to fulfil the requirements of this strategy.

The aims, objectives and scope of the strategy accords with the Vale of Glamorgan's Supplementary Planning Guidance for Sustainable Development.

3. Status and Ecology of Species and Habitats Potentially Affected by the Proposals

Protected species have been identified on the majority of sites which are to undergo development. These species include badgers, otters, bats, dormice, reptiles, great crested newts and nesting birds. Hedgerows identified as "Important" under the 1997 Hedgerow Regulations and UK Biodiversity Action Plan (UKBAP) habitats such as Saltmarsh have also been recorded over the site.

3.1 European Protected Species

European Protected Species are those species listed on Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) *[also known as the Habitat Regulations]*. Of the species recorded on site, these are:
Bats (all species)
Dormouse
Great Crested Newt
Otter

In addition, these European Protected Species are afforded further protection with respect to disturbance and trade under Section 9 of the Wildlife and Countryside Act 1981 (as amended).

European Protected Species are *inter alia* protected against:
Deliberate killing, injuring and taking
Deliberate significant disturbance
Damage or destruction to its resting place or breeding site.

3.1.1 Bats

There are 17 species of bats resident in Britain, although one species is considered to be extinct. Bats are small flying mammals that are nocturnal (active during the night) during their active season which is roughly April to October. Bats in Britain feed exclusively on insects and other invertebrates such as spiders. However insects are in short supply during the winter months and so bats hibernate in their winter (hibernation) roosts to survive this lean period. Bats emerge from hibernation around late March/early April and move into transition/intermediary roosts. By the beginning of May, female bats have gathered in their summer/maternity roosts where they will give birth to a single baby between late May and early July. Mother and baby bat will stay in the maternity roosts until August and the baby is weaned and independent by the autumn. After this time, the bats will move to transition / intermediary roosts. Autumn is the time of voracious feeding, whilst bats gain the extra weight required to hibernate.

Bats can roost in may different types of structure, including man-made structures such as bridges, ice-houses, pill-boxes, disused railway tunnels etc; in houses and other buildings; in natural structures such as caves or rock faces; and in trees. Bats do not have territories as such, but have home ranges which vary from species to species. The smaller bats such as the pipistrelle (Pipistrellus spp) may fly just 3-4km from the roost to feed, while large bats such as the noctule (Nyctalus noctula) may fly 20km or more. Bats have few natural predators as they can out-manoeuvre most aerial predators. Owls are opportunistic hunters and will occasionally take bats;

however the domestic cat is a far more efficient predator, taking bats as they emerge from their roosts.

3.1.2 Great Crested Newt

The Great Crested Newt is one of the two rarest amphibian species in Britain and is the largest of the three newt species. It is primarily a terrestrial animal, spending much of its life on land, but returning to the water to breed. The great crested newt, in similarity with other British amphibian species, will often return to breed in the same waterbody that it was spawned in. However, they are opportunistic and will also colonise suitable new waterbodies rapidly. Newts are comparatively weak swimmers and prefer still or very slow moving water, such as in ponds, ditches and canals.

Great Crested Newts lay eggs in the spring which hatch into water-dwelling larvae, and by the end of the summer most of these turn into young air-breathing juvenile newts, with some youngsters overwintering as larvae in the water and completing the lifecycle the following spring. Adult and juvenile newts typically hibernate during the winter months on land, but may occasionally remain in water in mild winters.

Both the adult newts and larvae are voracious predators, taking and eating a diverse range of invertebrate and other prey items, including the smaller species of newt, and they are also cannibalistic. They in turn form prey items for many other animals, and are taken regularly but seldom eaten as they are toxic, the bright yellow and black coloured belly serving as a warning to would-be predators. Perhaps the greatest natural threats to great crested newts are other aquatic predators that eat the larvae and eggs, either deliberately such as dragonfly larvae and fish, or accidentally such as ducks and geese.

Great Crested Newts are relatively long-lived animals, with individuals often reaching 15 years of age. They are also comparatively slow to develop and do not reach sexual maturity until 2-4 years old. Immature or juvenile newts do not return to breeding ponds until they are ready to breed. Whilst on land, the favoured habitat for the newts is usually woodland, but they also utilise many other habitats including scrub, hay meadows, grazed pasture, arable land and hedgerows etc, where these offer suitable moist and shaded conditions. Breeding appears historically to have taken place typically in small farm and field ponds, usually with gently sloping banks. However, they also breed in many other types of waterbody, including concrete-sided ponds and cisterns, quarry ponds, disused swimming pools, canals, ditches and ornamental ponds etc. The main habitat preferences appear to be for small to medium-sized, still waterbodies, with good vegetation cover, moderate shade and an absence of predatory fish and/or invertebrates. Water quality appears to be a less significant factor, provided the water is not actually toxic.

3.1.3 Dormouse

The common or hazel dormouse (Muscardinus avellanarius) is a small, native rodent, living an arboreal (tree-dwelling) lifestyle during its active season active (from mid April to early October) and hibernating in below-ground nests through the winter and much of the spring when food is in short supply. Dormice breed during the summer months, with the first litters being produced in June/July and if conditions are right, the female will produce a second litter in late August. Dormice feed primarily on ripe fruits, seeds, pollen and flowers, but are also thought to take small invertebrates.

Unlike most rodents, dormice live at relatively low population densities, maybe only 8-25 per hectare of woodland. Therefore, dormice require relatively large areas of woodland to maintain a viable population. This can be one large woodland, or several smaller parcels well connected by hedgerows and/or scrub. The home range of a dormouse is small (<100m radius from the nest) as they do not/are not capable of travelling large distances. They move through the canopy, preferring to stay off the ground and out of reach of many predators; and it is this that presents a barrier to dispersing dormice.

Dormice have few natural predators as they do not live at sufficient densities to provide a sole food source. Where modern housing estates bring people into contact with dormice, perhaps the most significant predator is the domestic cat. Natural predators include owls, weasels, squirrels, magpies etc.

3.1.4 **Otter**

Otter (*Lutra lutra*) are accomplished predators and one of Great Britain's largest mammals. An otter can inhabit a home range of up to forty kilometres of waterway. Although mainly nocturnal otters are also active throughout the day in a diverse array of freshwater and coastal habitats, including rivers, streams, ditches, wetlands, lakes, ponds and reservoirs.

Otters feed on a variety of prey that varies throughout a season depending on the most abundant prey species present at a given time of year. Fish species and eels are among the favoured prey whilst amphibians such as frogs and toads become increasingly important prey during late winter and early spring. Otters can breed at any time of the year and the cubs remain with the bitch for a year or more.

An otter's territory must include an adequate number of safe resting areas or holts along the watercourse. Holts can take various forms including exposed root systems at water level, natural cavities along river banks and man-made holes/tunnels such as under bridges and culverts. Lying up sites, or above ground holts can be found in dense areas of scrub and couches in rough grassland. Suitable breeding holts are in short supply as they need to be sited in a secluded area away from disturbance. Otters are not confined to large rivers and small-secluded tributaries can offer ideal breeding locations, as well as providing important resting holts in flood conditions. Otters have no natural predators, and it is man's activities that cause the greatest mortality. Otters are frequent road casualties.

3.2 Nationally Protected Species

3.2.1 **Badger**

Badgers and their setts are afforded limited protection under the Wildlife and Countryside Act 1981 (as amended). However, their main protection comes from the Protection of Badgers Act 1992; under this Act it is an offence to:

- Kill, injure, take or attempt to kill, injure or take a badger
- Disturb a badger while occupying a sett; or

Interfere with a badger sett by:

- Damaging or destroying a sett
- Obstructing access to a sett

The 1992 Act defines a badger sett as: "any structure or place which displays signs indicating current use by a badger".

The badger (*Meles meles*) is a nocturnal mammal which lives in social groups in underground homes called setts. They are one of Britain's most recognisable animals and are relatively common and widespread throughout the UK. Badgers are omnivores, taking vegetation and animals in their diet. A favoured food of badger is earthworms but they are opportunists and will take advantage of other foods, such as fruit, eggs and plants. Although badgers are typically associated with woodland for sett building and foraging setts can be dug in many different habitats, including scrub, hedgebanks and grassland. Badgers will forage over wide areas throughout their home range which can comprise many habitat types, including woodland, grassland, parkland, hedgerows and hedge-banks.

3.2.2 **Breeding birds**

All naturally occurring bird species in Britain are protected under the Wildlife and Countryside Act 1981 (as amended). The legislation protects all birds, their nests and eggs and it is an offence to:

- intentionally kill, injure and take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird while it is in use or being built; and
- intentionally take or destroy the egg of any wild bird.

In addition to the basic protection, any bird listed on Schedule 1 of the above legislation is afforded further protection and it is an offence to:

- intentionally or recklessly disturb the bird while nest building or while at (or near) a nest with eggs or young; or
- disturb the dependent young of such a bird.

Some birds are exempt from protection for certain purposes.

Birds are egg layers and in Britain generally breed between March and September, although they are able to breed all year round if winters are mild enough. Some birds have only one clutch of eggs, whilst others will double- or even triple-brood. Birds in Britain do not hibernate, as many mammals do, but some will migrate to warmer climes for the lean period, returning in the spring.

3.2.3 **Reptiles**

All UK native reptiles are protected by the Wildlife and Countryside Act 1981 (as amended) which protects them from intentional killing and injury. Where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring. Where reptiles (not including sand lizard, smooth snake and turtles) are present on a development site, they will not prevent the development from taking place, however, the development should put in place Reasonable Avoidance Measures to prevent, as far as possible, killing or injuring of any reptiles.
There are four reptile species that occur within the Vale of Glamorgan. These comprise two lizard and two snake species, which are: slow worm (*Anguis fragilis*),

common lizard *(Zootoca [Lacerta] vivipara*), grass snake (*Natrix natrix*) and adder (*Vipera berus*).

Reptiles are ectotherms, meaning that they require an external heat source to raise their body temperature. To aid this, they will naturally use any suitable refugia to bask on or under. Adder and Grass snake and common lizards, will often bask directly in the sun to warm themselves, providing there is sufficient cover nearby to offer a quick retreat. Slow worms are different in this respect, as they prefer to regulate their body temperature from underneath flat objects that readily warm up in the sun. They will obtain heat through conduction directly from this surface, and rarely venture out onto open ground to bask.

All reptile species are predatory, and depending on the species, prey on invertebrates, amphibians and small mammals. They are active when ambient temperatures are relatively high (generally April to September), hibernating underground during the colder winter months and entering a period of summer dormancy (July-August) should ambient temperatures become excessively high. All the aforementioned species bear live young, with the exception of grass snake which lays eggs.

Reptiles have varying habitat requirements, which allow them to bask, seek cover and shelter, carry out courtship displays, provide adequate food and suitable underground sites for hibernation.

3.3 Habitats:

3.3.1 Hedgerows

Hedgerows are considered valuable habitats as they act as wildlife corridors and are a primary habitat for many species, especially for butterflies and moths, farmland birds, bats and dormice. Hedgerows are the most significant wildlife habitat over large stretches of lowland UK and are an essential refuge for a great many woodland and farmland plants and animals.

Certain hedgerows, which meet defined criteria are designated as “Important Hedgerows” and are protected under the 1997 Hedgerow Regulations. Hedgerows are UK biodiversity action plan priority (BAP) habitats.

3.3.2 Woodland and Trees

Mixed deciduous woodland is listed as a UK BAP priority habitat and is important for a wide variety of species. Woodland can be important for numerous bird species, mammals including dormice and bats, as well as invertebrates.

Ancient semi-natural woodland is woodland that has persisted in the landscape since around 1600 A.D.

3.3.3 **Scrub**

Although this habitat type is not listed as important in the UK BAP priorities or in the Section 42 list of species and habitats of importance in Wales it retains significant within a site context. It provides cover for many species, and breeding areas for birds and invertebrates.

3.3.4 **Saltmarsh**

Saltmarsh is a declining habitat where land has been agriculturally improved. It is an important plant community which supports wading birds at high tide. This habitat is a UK BAP priority habitat, is listed as a Section 42 habitat (NERC Act) as a habitat of principal importance for biological diversity conservation in Wales and also features in the Vale of Glamorgan's Local Biodiversity Action Plan (LBAP).

Saltmarsh comprises areas of salt-tolerant vegetation mainly found in intertidal land where there is a net accumulation of sediment and shelter from strong wave action. In the Vale, they are found in the estuary areas of the Ogmore and Thaw. It is an important habitat both for its specialist, often unique plant species which can tolerate the harsh environment, and for overwintering and passage birds.

Plant species diversity in saltmarsh areas is relatively low compared to other coastal habitats but many of the characteristic species are found nowhere else, and even some of the non-specialist species are ecotypes adapted to saline conditions.

3.3.5 **Marshy grassland/Rush Pasture**

Marshy grassland and rush pasture are considered important habitats as they provide cover for many species including ground nesting birds, amphibians, reptiles and some mammals. The rich invertebrate life can provide important bat foraging habitat. They can also be of importance floristically if they support plants of conservation concern. Rush pasture is a UK BAP priority habitat and appears on the habitats of conservation importance in Wales list (Section 42 list).

3.3.6 **Semi-improved grassland/Lowland Meadows**

Semi-improved grassland is important for some bird species and maintaining a good diversity of invertebrate fauna. A structural diversity in this type of habitat can be beneficial to basking and hunting reptiles and amphibians. Semi-improved grasslands can support plant species of conservation concern and therefore certain types of semi-improved grassland are considered to be UK BAP priority habitats which are also Section 42 list habitats of conservation importance in Wales.

3.3.7 **Ponds**

Ponds are a declining habitat on agricultural land. They are threatened not only by in-filling but from pollutants entering the water. Ponds are important habitat for some protected species such as great crested newts, toads and grass snakes as well as for birds, invertebrates and some plant species. Some ponds are considered to be priority habitats within the UK BAP where they contain protected and priority species and species of conservation concern.

3.3.8 Reedbed

Reedbeds, although not usually floristically diverse are considered important for their habitat value to protected and other species. Reedbeds provide excellent cover for bird nesting, water vole, dormice, harvest mice and otter lying up sites. These habitats may also provide good bat foraging areas due to the abundance of flying invertebrates. This is a UK BAP habitat and is listed on the habitats of conservation importance for Wales.

3.3.9 Rivers

Rivers provide natural dispersal corridors for many species since the linear habitat may have associated bankside vegetation. Otters rely on clean rivers and streams for foraging and the bankside vegetation for resting and breeding sites. Bats are also highly likely to commute and feed along water courses, which particular reference to Daubenton's bat. Other species reliant on river include fish, white clawed crayfish and some birds and invertebrates.

3.4 Other relevant legislation

Natural Environment and Rural Communities (NERC) Act 2006

The duty is set out in Section 40 of the Act, and states that:

"Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity"

As part of this duty in Wales, the Welsh Assembly Government has compiled a list of species and habitats considered as of principal importance for the conservation of biological diversity in Wales – the Section 42 list.

3.5 Licensing Requirements

Certain species and certain works require a licence to be in place in order for the works to proceed. This licence is required in addition to planning permission.

3.5.1 European Protected Species

Where a European protected species is present, a development may only proceed, under a licence issued by the Welsh Assembly Government (WAG) which is the appropriate authority responsible for issuing licences under Section 44 of the Habitats Regulations.

3.5.2 Badger

Where works will directly affect a badger sett, or take place within 30m of it, a licence, issued by the Countryside Council for Wales under Section 10 of the Protection of Badgers Act 1992 may be required.

3.5.3 Breeding birds

There are no licensing requirements relevant to this scheme.

3.5.4 **Reptiles**

There are no licensing requirements relevant to this scheme.

4. Potential Impacts of Development

All the species and habitats listed in the previous section are potentially adversely affected by the proposed development. Following is a brief description of the types of impacts potentially occurring and the consequences of the impacts.

No attempt to evaluate the likelihood or the severity of the impacts has been made within this report as this is considered in the Environmental Statement. Some evaluation of specific ecological features such as bat roosts has inevitably been necessary in order to inform the level of mitigation and enhancement required to fulfil the requirements of this strategy.

In general impacts upon habitats and species can be summarised under the following headings:

4.1 Habitat Loss

The loss of scrub, grassland, trees, ponds, buildings etc. to development can lead to reduced populations or even local extinctions of species due to the loss of breeding habitat or food resource etc.

4.2 Habitat Severance

This effect is most likely to arise from proposed linear developments such as the new or re-aligned roads. This effect can lead to separation of a species from essential components of its habitat such as breeding ponds or foraging grounds. Isolated populations can result preventing gene flow/variation and leading to in-breeding. Habitat severance can often lead to road mortality as the animal attempts to cross to reach its required or previous habitat.

4.3 Habitat Degradation

This can occur through pollution, for example of watercourses leading to direct effects on the species using the watercourses and indirect effects as prey becomes scarce. Similarly the introduction or increase in lighting levels can cause nocturnal species to avoid using an area or building used previously as the context has changed. The alteration of hydrological regimes through the introduction of a road and its associated drainage can degrade wetland habitats, drying them out over time and causing a change in the species composition and the habitat itself.

5. Overall Mitigation and Enhancement Strategy for the St Athan Development and Associated Works

5.1 Bats

Mitigation for bats will generally be carried out under a European Protected Species Development Licence and will consist of the elements outlined below:

Replacement for loss of roosts / provision of new roosts to consist of:

Construction of new, purpose-built bat house buildings incorporating provision of winter (hibernation) bat roost sites through the creation of new underground structures for hibernation and/or grilling of existing underground structures.

Refurbishment / enhancement of existing buildings, incorporating bat access.

Planting / landscaping to create new foraging grounds / enhance existing foraging areas and to create bat flight lines.

Roost locations and flight lines to be complimented by sensitive site lighting.

5.1.1 Bat buildings

Five purpose built bat buildings will be erected, located around the periphery of the development sites as shown on Drawing CG/3824/001. These will be of block construction with a pitched roof over bitumen underfelt sarking, utilising traditional roof construction methods. These buildings will be cavity-walled, "L" shaped buildings with the longer section being at least 10m long, with the shorter section at least 6m long. The building shall be at least 5m high from ground to ridge, and each of the six buildings will incorporate an underground section. Figure 1 shows a typical construction.

The underground section will either be a newly created cellar or an existing disused military structure e.g. air raid shelter. The underground section will either be directly underneath the building or immediately adjacent to it; whichever option is chosen it will be directly accessible by bats from the ground floor of the building. Roost conditions in the underground section will aim to achieve at least 90% humidity and relatively stable temperatures of between 4^{o}C and 10^{o}C, aiming for 8-10^{o}C in the buildings with lesser horseshoe bat access.

The buildings will incorporate a roof space as described above which will be accessed via an open hatch. Bat access will be located at the gable apexes, and at the ridge (on three buildings). Three of these buildings will include an open fronted section for night roost / feeding perch. Of the six buildings, two will include a lesser horseshoe bat access point and where present will be on the ground floor. In the bat buildings, bats will have the full use of the cooler ground floor space.

All summer roost sites will be heated by passive solar heating, with the exception of two buildings, which will have thermostat controlled heating, to be supplied either by the on-site biomass heating system or conventional heating.

A separate planning application will be for the advanced construction of these buildings in order to provide at least some of them prior to the commencement of the

main developments. This application will be made early in the determination period of the main applications.

5.1.2 Refurbishment of existing buildings

There are few buildings being retained as part of the Defence Technical College. The existing East Gate Guardhouse and the Picketston Guardhouse appear suitable for use by bats with some enhancement. The Picketston Guardhouse was found to support *Myotis* sp. bats in 2007, but nothing in 2008 or 2009 and is thought to be a defunct roost.

A number of buildings will remain as part of the Aerospace Business Park proposals. Of note are 2 pairs of semi-detached unoccupied dwellings. One of the houses has been identified as a pipistrelle bat roost. Both buildings will be enhanced/converted to allow full use of the roof space by bats, with the other areas of the houses being used for other (non-disturbing) purposes. These buildings together will form Bat House 6.

5.1.3 Dual use buildings

Two storage sheds, to be located in association with the sport facilities will be of block construction with a pitch roof of tile over bitumen felt, on tanalised timber beams and rafters in traditional construction methods. The buildings will be a minimum of 20m long, 10m wide and 6m high The joist to ridge beam clearance will be a minimum of 2.5m and will be segregated from the ground level space by a ceiling, which will be boarded to allow for easier monitoring. The ground floor level will be used for storage of equipment, whilst the roof space will be for use by bats. The roof space will be accessed via a hatch in the ceiling. As an attic hatch is not readily accessible, there will not be any lock. One of these buildings will incorporate a Lesser Horseshoe bat access point. Both buildings will corporate bat access at both gable ends. Bat access will be incorporated at the ridge in the non-horseshoe access building. Both buildings will include a cavity wall on at least one side. Alignment of these buildings will be dependent upon their location on site. Bat droppings will be collected from the brown long eared bat roosts and introduced into these buildings.

5.1.4 Trees with High Potential to Support Roosting Bats

The location of trees with a high potential for use by roosting bats are shown on Drawing CG/3824/001. These trees were assessed as part of the baseline surveys, but no emergence surveys have been undertaken to date. The transient nature of tree roosts makes it very difficult to prove a tree is not being used as a roost. The very long timescales associated with these developments would negate the value of a survey undertaken at this point, as the situation in respect of a tree roost can change relatively quickly.

Emergence surveys will be undertaken in the season prior to the felling of any tree with a high potential for use by bats. Trees of high potential will be felled in accordance with the best practice protocol set out in Appendix A.

5.1.5 Flightlines / dark corridors

The landscaping scheme will create movement corridors for wildlife, including bats throughout the development sites. These corridors will vary in size between 5m wide to 40m wide and will include trees/woodland, scrub and long grass. They will be dark

to allow for the movement of the light-sensitive species around the site. Locations of the wildlife corridors are shown on Drawing CG/3824/001.

5.2 Great Crested Newt

Great Crested Newt populations have been recorded by surveys in the following locations:

Defence Technical College site – Breeding populations are present in three of the existing surface Emergency Water Supply (EWS) ponds at East Camp. The three EWS ponds support medium to large-sized populations, and are collectively considered to be of regional, possibly national importance. The EWS ponds will be lost to the development. Surveys indicate that the populations in the EWS tanks are largely confined to the ponds and their immediate environs, being otherwise largely surrounded by terrestrial habitats which are inimical to Great Crested Newt.

Aerospace Business Park site – Two ponds in pasture fields at Batslays also contain small to medium-sized breeding populations of Great Crested Newt. The ponds are to be retained, but there will be some loss from the surrounding terrestrial habitat.

West Orchard & Beggars Pound – Some 11 new compensation ponds were constructed in 2007 in advance of specific works to be undertaken at the St Athan airbase. These ponds are intended to act as receptor ponds for newts removed from the East Camp EWS ponds prior to the development. Two of these ponds are now colonised by small numbers of Great Crested Newt, but the remaining ponds have been fenced to prevent any further spontaneous colonisation in the interim.

DTC – Castleton Field Training Area - A single pond in the centre of this area contains a small population of Great Crested Newt. This pond is to be retained, with improvement to the surrounding terrestrial habitat being anticipated through less intensive land management as a result of the development.

Llantwit Major area – Three ponds to the north-west and west of Llantwit Major, near the Llantwit Sewage Treatment Works, have been found to contain small populations of Great Crested Newt, and others in this area are also either known to support this species or are suspected of supporting them. These ponds, which lie about 2km to the west of the airbase, will not be directly affected by the St Athan development, but probably form part of the same population group ('metapopulation') as the other ponds referred to above.

Surveys for Great Crested Newt have been carried out over a wide area of land surrounding the airbase, but have not found any other populations to date. On the basis of present survey information and analysis, it is considered very likely that all of the occupied ponds identified to date represent remnants of a formerly much-larger Great Crested Newt metapopulation which has subsequently become fragmented due to the creation of barriers and the general loss of breeding ponds in the surrounding landscape. On the basis of the available survey evidence, it is surmised that there is probably still a broad exchange of individuals in an east-west direction between the various groups of occupied ponds, running across and through the airbase (or around it, for example via the railway line and the wooded edges of the B4265). There is unlikely to be any exchange or movement to the east of the River Thaw, which represents a very significant landscape barrier to movement by Great Crested Newt.

There is also likely to be some north-south exchange between the groups within the airbase and at Batslays. Movement further to the south is probably limited by significant landscape barriers such as the railway and the B4265 and no populations have been found to the south of the B4265 in the vicinity of the proposed developments to date. Movement to the north of the airbase is likely to be limited by the absence of suitable breeding ponds in this area: it is thought that breeding ponds are used as 'stepping stones' by the newts as they move through the landscape, and there are virtually none in the area north of the airbase. The lack of suitable breeding ponds may also explain why there do not appear to be more populations in the areas immediately to the east and west of the airbase.

Mitigation and Enhancement Strategy for Great Crested Newt

The proposed mitigation strategy for Great Crested Newt is shown on Drawing CG/3824/002 and primarily comprises the creation of a 'necklace' of breeding ponds around the periphery of the redeveloped site, the majority of which will comprise newly created ponds.

The primary objectives of the mitigation strategy for Great Crested Newt are:

1 to provide a landscape-scale network of breeding ponds around the airbase, interlinked by suitable terrestrial habitats;
2) to continue to allow and encourage the flow both of individuals and of genetic diversity particularly in an east-west direction from west of the airbase at Llantwit Major to east of the airbase at Castleton Farm, and also to the north and south;
3) to increase the connectivity of populations that currently exist within the MOD site, (which are to be translocated to the purpose-built habitats as part of the strategy) and those around the proposed development site, and to increase the net number, density and size of populations in the area;
4) to allow and encourage the occupation of areas of suitable terrestrial habitat in the area around the development site which does not currently support great crested newt, particularly to the north of the airbase, where it is thought that the lack of occupation is mainly due to the lack of suitable ponds;
5) to exclude Great Crested Newt from all areas of the developed site which will be unsuited to occupation by this species.

The proposed mitigation strategy primarily comprises the creation of a 'necklace' of breeding ponds around the periphery of the redeveloped site, the great majority of which will comprise newly created ponds. These ponds will, as far as possible, be a maximum of 500m apart (often less), and will be linked by a continuous corridor of terrestrial habitats which are suitable for movement, foraging and hibernation by Great Crested Newt. The pond 'necklace' will also have connections which extend out into the surrounding countryside. This is particularly significant around the northern perimeter of the site, where it is anticipated that the new ponds would encourage and allow the colonisation of terrestrial habitats off-site from the base which do not currently appear to be occupied by Great Crested Newt. New amphibian underpasses, and in some cases overpasses (eg at Llanmaes Brook), will allow movement by Great Crested Newt across both existing and new barriers to terrestrial movement by this species, such as roads and watercourses, in an effort to reverse the fragmentation of habitats which has occurred in the past and mitigate any new fragmentation which may arise as a result of the development.

A separate planning application will be for the advanced construction of the ponds and associated underpasses in order to provide at least some of them prior to the commencement of the main developments. This application will be made early in the determination period of the main applications.

The strategy also envisages that Great Crested Newt will, as far as possible, be excluded from the main operational parts of the redeveloped site, by means of newt-proof fences. The operational areas are expected to comprise habitats which are largely either inimical to the newts, or which will be managed in such a way as to be unsuitable, for example through very regular mowing (as is currently the case on the airbase). Newt underpasses and stop-grids will be installed at locations where the perimeter newt-fence is broached by access roads and pathways etc. Newts will not be excluded from areas such as Castleton Farm, for example, where Field Training is to be carried out.

A management regime will be implemented to ensure and maximise the suitability of the new and retained habitats for Great Crested Newt.

This overall approach was initially discussed and agreed with the Countryside Council for Wales in 2004, and has been discussed with them subsequently at various times since.

It is anticipated that the proposed mitigation approach will ultimately result in a considerable enhancement of the situation for Great Crested Newt in the airbase area. Enhancement would arise as a result of:

1) A very substantial increase in the number of ponds which are suitable for breeding use in the St Athan Area: the number of ponds in the area around the airbase would be increased from the pre-existing six (three of which will be lost to the development) to a total of 35.
2) The creation of a dense 'pond network' ('supercluster') in the area of the airbase, none of which would be more than 500m from other ponds in the network (500m being the average maximum 'roaming distance' of Great Crested Newts).
3) An enhanced network of terrestrial habitats which links the ponds together, as well as to the surrounding landscape, and which will be managed to optimise its suitability for commuting, foraging and wintering use by Great Crested Newt.
4) The exclusion of newts from habitats which are managed unsympathetically and which are likely to represent a significant source of mortality.
5) Providing a means to occupy (or possibly to reoccupy) significant areas of suitable terrestrial habitat in the vicinity of the airbase, particularly to the north and west, from which Great Crested Newt presently appears to be absent, most probably due to the lack of suitable breeding ponds.

5.3 **Otters**

Surveys over 2007 and 2008 have recorded otter on all watercourses within the St Athan development area. No otters were recorded at Waycock Cross.

In general impacts on otters are likely to arise principally from the construction and operation of the Northern Access Road, the Gileston to Old Mill road improvement and the Service Families Accommodation (SFA) at Tremains Farm and Picketston. Otters could also suffer occasional disturbance from activities at the Castleton Field Training Area, which is in close proximity to the Thaw and Rills Valleys. The training area is separated from the Thaw by a substantial woodland block (Oxmoor Wood)

and from the Rills Valley by Castleton Wood. Further planted buffer zones will augment this protection and it is anticipated that any disturbance will not be significant.

Most impacts upon otter can be removed / significantly reduced during construction through the practices outlined below:

- Construction operations near watercourses will be undertaken during daylight hours only
- Precautionary measures must be taken to prevent toxic or waste spillages during construction, e.g. bunding of fuel tanks and avoiding toxic chemicals on the construction site. Contractors should provide appropriate Risk Assessments and Method Statements concerning the use of environmentally hazardous materials and operations.
- All construction debris must be removed from the river and its banks; and the areas disturbed by the construction (including the river bed and riverbank) should be restored to as natural a condition as possible.
- Should any fencing be erected during the works (not including otter proof fencing), access for otters must be maintained at all times. Therefore, either a continuous gap or gaps at regular intervals along the fence will be required. These gaps must be at least 225mm high 225mm wide.
- Works associated with the river will operate during daylight hours only, ceasing operations at least one hour before sunset and not commencing until at least one hour after sunrise, to minimise disturbance to otters moving along the river during the night.
- It is unlikely that excavations are likely to provide difficulties for otter movements, but if excavations in excess of 600mm deep are to be left open at night, these shall have at least one gently sloping side, or will be provided with an escape route for otters by means of wooden ramp(s).
- Building materials, pipes, machinery and stockpiles will be stored within an otter-proof compound at night. This is of particular importance where materials are stored near identified otter habitat.
- The river/stream will be unobstructed for otter travel at all times to allow otter passage.

During operation, road deaths can be prevented by the maintenance, upgrading or creation of underpasses, ledges and culverts under the roads and the provision of otter proof fencing over appropriate distances from watercourses.

In addition to preventing negative impacts, the creation of resting areas through the planting of scrub along watercourses and the provision of artificial holts will provide enhancement.

A buffer zone of at least 7 metres will be maintained around the watercourses.

The ponds created as part of the Great Crested Newt mitigation will also benefit otters, supplying amphibian prey, which is important to otters particularly in winter and early spring.

5.4 Dormouse

Dormouse was identified in the surveys in an area near the entrance to West Camp. The planting here is connected via the railway and also the roadside planting.

Impacts will arise from the potential loss of habitat due to the construction of the Northern Access Road, principally its large junction with the B4265, but the main impact will be loss of habitat connectivity.

The proximity of proposed housing will also increase the risk of predation by domestic cats.

Mitigation will be provided by planting a 15 metre wide scrub belt along the southern (Boverton Brook) and eastern, (Llanmaes Brook) boundaries of the proposed Service Families Accommodation housing site, under the proposed Llanmaes Brook bridge and linking back to the B4265 roadside planting via the northern edge of the Northern Access Road. Connections across the brooks and footpaths will be provided for by use of structures such as steel “arbors” planted with climbers and Dormouse/Green bridges. A more detailed description is provided at Section 10, Northern Access Road.

Connectivity via the railway corridor will remain unaffected.

5.5 Breeding Birds

In general, the main impacts on breeding birds will result from site clearance operations, including demolition.

The impacts of the development can be alleviated / removed through Best Working Practices with regards to birds. This is as follows:

- All vegetation clearance must be undertaken outside of the bird breeding season (the bird breeding season is generally taken as March to September inclusive).

- Any active nests found during works, regardless of time of year, must be left *in situ* and undisturbed until the young birds have fledged. Active nests will be cordoned off, with temporary fencing at a minimum radius of 20m; no works will be carried out within this area. An ecologist shall make regular checks of the nest site, and when the young have fledged, the ecologist will inform contractors that works may recommence in the nest site area.

- Wherever possible, buildings with potential to support breeding birds will also be demolished outside of bird breeding season. Where this is not possible deterrent measures such as netting could be employed provided there are no issues relating to bats in respect of the specific buildings.

  It should be noted that landscape proposals for the site and its surroundings have complied with the Civil Aviation Authority (CAA) publication “*CAP 772: Birdstrike Management for Aerodromes*” as it is not considered desirable to encourage bird life in the vicinity of airfields.

5.6 Reptiles

Reptiles have been recorded in numerous areas of the proposed St Athan development.

The main impacts of the development will be:

- Accidental killing or injury during construction works.
- Habitat loss, degradation or fragmentation, causing loss of connectivity and consequent gene flow.

Mitigation will generally look to protect reptiles *in situ* during construction, allowing re-colonisation following completion of these works. Wherever possible, animals will be moved on site, or to adjacent sites.

However, there may be occasions when this is not possible, for many reasons including: a large donor population, a large existing receptor population, low quality/unsuitable habitat or habitat unable to be modified to increase the carrying capacity. In these cases, the animals will be translocated a pre-selected receptor site such as Castleton Field Training Area, the fields behind the officers' houses at West Camp and the area of habitat surrounding the ruins of West Orchard Castle in the St John's Valley to the south of the main MOD St Athan airfield. The St John's Valley offers optimal lizard habitat, abundant natural refugia and a plentiful supply of invertebrate prey.

Translocated reptiles will be accommodated overwinter by provision of additionally constructed hibernacula at two chosen receptor sites; St John's Valley and Castleton. The area behind the officer's houses at West Camp already provides good conditions and hibernacula will only be constructed here if necessary.

From conducted surveys, the population densities of the current reptile populations within the St John's Valley are low and hence the carrying capacity of this site is extensive.

Reptile clearance will be undertaken through a combination of habitat manipulation and fencing and trapping.

Reptile clearance will be undertaken through a combination of habitat manipulation and fencing and trapping.

5.7 Badgers

Badger activity across the survey area generally has been low. Setts and/or other signs of badger have been recorded at Gileston, south of West Camp, in the vicinity of the Northern Access Road and at Picketston.

From the survey results it is highly unlikely that any setts will be destroyed by the proposed works.

The main impacts on badgers from the proposed developments will be loss of foraging habitat, habitat severance and potential road deaths.

During construction impacts can be removed or alleviated through good working practices generally described as for otter above.

The provision of badger fencing along the Northern Access Road, Southern Access Road and the Gileston to Old Mill sections will be employed. Badgers will be able to cross the new or improved roads under existing or proposed bridges. The new or improved road constructions are generally at grade or on low embankments negating the potential of providing specific underpasses for large mammals.

5.8 Hedgerows

A number of hedgerows across the site are designated as "important" under the 1997 Hedgerow Regulations or are considered species-rich.

The majority of hedgerows (including "important" hedgerows) within the area are intensively managed for agricultural purposes and as such do not generally provide good ecological habitat.

Impacts on hedgerows will be complete loss or more often severance of the hedgerow.

Mitigation will comprise the translocation of hedgerows where practical and appropriate and the planting of new hedgerows.

5.9 Saltmarsh

No significant areas of saltmarsh will be directly affected by the proposals.

5.10 Overall Biodiversity Enhancement

A number of species of biodiversity importance are present at the site in addition to those listed above which receive specific legal protection. These include: mammals such as Polecat and Hedgehog; butterflies such as Pearl Bordered Fritillary and Small Heath; moths, including Cinnabar and August Thorn; amphibians – Common Toad; and numerous bird species such as Skylark, Linnet, Song Thrush, Lapwing and Grey Partridge.

Overall biodiversity enhancement of the site will be realised through a number of both specific and incidental measures:

- The specific features designed for the protected species will also benefit overall biodiversity:
    - Scrub and woodland edge planting designed for bats and dormice will benefit numerous species including invertebrates and birds;
    - The ponds provided for the Great Crested Newt mitigation will also attract invertebrates providing prey for other amphibians such as Common Toad, which in turn would attract Grass snake and otter to use the ponds;
    - The ponds will provide "stepping stone" habitat within the ecological corridor allowing dispersal of various species;
- The change in use of areas such as Castleton Farm will result in less intensive management compared to the current intensively managed agricultural regime

and habitats will become more varied and species-rich supporting a greater assemblage of species.

- Landscape planting within the development sites, roadsides and Service Families Accommodation areas will provide cover and foraging habitat for a variety of species;

- The designs of the various elements of these proposals seek to retain important vegetation such as hedgerows and mature trees with landscape designs seeking to provide conduits through the developments maintaining connection with the wider landscape.

- The majority of specific biodiversity enhancement features will be incorporated into areas where they will be most effective. These will generally be the Castleton Field Training Area, St John's Valley and the habitat corridor provided for the Great Crested Newts. These specific features will include the provision of dead wood habitat piles, reptile/amphibian log pile hibernacula, the provision of scrapes and wheel ruts giving ephemeral pools.

  These measures are discussed further in the relevant sections.

  Even though numerous UKBAP, LBAP and Section 42 species of bird have been recorded at the sites, no specific enhancement or compensation measures have been proposed due to the CAP 772 requirements, although birds will benefit generally from the biodiversity enhancement measures proposed for protected and other species as well as the landscape planting associated with the various developments.

6. Defence Technical College: East Camp

6.1 Construction Information

In order to facilitate the construction of the Defence Technical College there are a number of early works that will be carried out as part of the Enabling Works by either the Welsh Assembly Government, MOD or Metrix, including:

- Asbestos removal
- Demolition of existing buildings on East Camp
- Service disconnections, alterations and diversions
- Ground decontamination
- Ecological mitigation works

6.1.1 Enabling Works Stage 1 (Summer 2009 – Summer 2010)

Refurbishment of existing buildings to the southern side of the existing East Camp will be undertaken, together with the construction of hardstanding and new buildings to allow No4 School of Technical Training (4SoTT) transition from their current existence, spread across a large proportion of East Camp to a confined enclave until the new DTC facilities are available. These advanced works are the subject of a separate planning application.

Asbestos removal and demolition of existing buildings which are currently vacant on East Camp along with service disconnections, alterations and diversions within the site boundary and along Eglwys Brewis road will be undertaken.

6.1.2 Demolition

Demolition of the existing buildings on East Camp will be carried out in a number of phases with the initial phases carried out as part of the Enabling Works for the Defence Technical College and the final smaller phases of works completed through out the main DTC construction period.

The initial demolition Phases 1 to Phase 3 inclusive will provide a clear platform for the main DTC programme and will take place from 2nd Quarter 2009 to 1st Quarter 2011.

Following receipt of planning permission (if granted) licenses to Disturb a European Protected Species will be applied for in respect of Bats and Great Crested Newts for all phases of work related to the construction of the DTC site, including: the DTC itself; Picketston sports facilities, Field Training Area and associated developments; Castleton Field Training Area.

These licences must be in place prior to the commencement of Phase 1 demolition.

6.1.3 Enabling Works Stage 2 (Spring 2010 – Autumn 2010)

Upon completion of the transition of 4SoTT to the southern enclave in Spring 2010, the remaining existing buildings on the northern part of East Camp will be demolished (except existing Medical & Dental Centre, Eglwys Brewis road Spar Shop and a small number of buildings to be used during the construction process.

Construction of the new Museum access point off Eglwys Brewis Road and installation of new perimeter security / boundary fencing to the main DTC site and Picketston.

Installation of construction site offices, welfare and compounds.

6.1.4 Construction Phase 1 (Summer 2010 – Winter 2013)

The bulk of the construction of the new DTC will be carried out over a 39 month period commencing Summer 2010 following the Great Crested Newt translocation, clearance of existing buildings and underground services on the existing East Camp.

Access for MoD personnel to the existing Medical & Dental Centre will be via the newly constructed Museum access off the existing Eglwys Brewis Road and access to the 4SoTT southern enclave will be via the existing East Gate.

6.1.5 Construction Phase 2 (Early 2014 – Spring 2014)

Completion of remaining Single Living Accommodation buildings, demolition of the 4SoTT southern enclave following transition of 4SoTT into the new DTC and demolition of existing buildings used for construction purposes on the main DTC campus.

6.1.6 Construction Phase 3 (Spring 2014 – Summer 2014)

Phase 3 DTC construction comprises the completion of hard and soft landscaping works to the southern car parking and existing East Gate following demolition of the 4SoTT enclave.

6.2 Summary of Ecological Survey Results for the DTC Site (East Camp)

6.2.1 Bats

Southern cross-shaped buildings

Building numbers: 437, 438, 439, 440, 441 and 442. Four of this group of six buildings have confirmed bat roosts, whilst the remaining two have old evidence of bats. All buildings should be treated as bat roosts. It is likely that these buildings collectively support a Brown long eared bat maternity roost and a common pipistrelle male roost.

Northern cross-shaped buildings

Building numbers: 394, 395, 396, 397, 398, 399, 400 and 401. Five of this group of eight buildings have confirmed bat roosts, whilst the remaining three had no evidence of bat use; however, all buildings should be treated as bat roosts. It is suspected that collectively, these five buildings support both a common pipistrelle maternity roost and a Brown long eared bat maternity roost.

Building numbers: 324, 344, 353, 361 and 377. These buildings are located in the eastern section of the DTC site.

Two of this group of five buildings have confirmed bat roosts, whilst one building had some bat evidence. The remaining two buildings had no evidence of bat use. However, the two buildings with no evidence and the one with limited evidence

should be treated with caution because of the similar construction and proximity to the confirmed bat roosts.

The winter bat survey has shown sustained activity by Pipistrelle bats in the vicinity of these buildings and the underground structures adjacent to them. It is expected therefore that these bats are using the same buildings over winter as in the summer.

Other buildings within the DTC site also have evidence of bat use: Building Numbers 293, 303, 455 and 540.

Twelve trees within this area are considered to have high potential for use by bats.

6.2.2 Great Crested Newt

The DTC site contains the largest Great Crested Newt populations found to date in the St Athan area, located in the three EWS ponds. These comprise structures 522 (Pond 20) 331 (Pond 19A) & 369 (Pond 19). The populations in these ponds are estimated to occur in the low hundreds at the peak of the breeding season. The populations are considered likely to have remained more-or-less static in terms of numbers throughout the survey period (2002-2008), with possible slight increases in Ponds 19 and 19A in 2008, and a possible slight decrease in Pond 20 in the same period.

6.2.3 Reptiles

A healthy population of Slow Worm has been identified at St Brise Church within the DTC site. This population seems to occupy a small area of land at the front of the church.

6.2.4 Breeding Birds

Breeding birds were ubiquitous throughout the St Athan Park survey area. Nineteen species were recorded as breeding within the DTC site area including Skylark, Linnet and Yellowhammer which are listed as S.42 species with Skylark also being a UKBAP species.

6.3 Detailed Mitigation for DTC Site

6.3.1 Transition of No. 4 School of Technical Training to Southern Enclave

Although this is to be undertaken as advanced works under a separate planning application, it forms part of this overall mitigation and enhancement strategy to ensure a piecemeal approach to ecological mitigation is avoided.

A number of the southern cross-shaped buildings described in Section 6.2.1 above will be refurbished as part of this operation. Any works affecting the roof space of the buildings must be undertaken under a Welsh Assembly Government licence.

The construction of new hardstanding and buildings is within area of amenity grassland or existing hardstanding and as such will not remove habitat of particular suitability for Great Crested Newt. The works are however, within 250 metres of a known Great Crested Newt pond and therefore a specific licence will be applied for or the works will be undertaken at the developer's risk in accordance with the following protocol:

The on site ecologist will undertake checks for Great Crested Newt before the start of each day of work, and this will be logged as a daily action in the site diary;

If a Great Crested Newt were to be found in any of the pre-construction checks, no work will be carried out at that location until further expert assistance and advice has been obtained;

The contractors will be vigilant throughout the demolition works, and if a Great Crested Newt is found at any time during the works, all work at that location will cease immediately until further expert assistance and advice has been obtained;

In the event of either of the above scenarios, the contractors will contact the appointed Great Crested Newt advisors for the site immediately, who will attend the site as a matter of urgency to assess the issue and determine the way forward;

In the event of either of the above scenarios, or in the event of multiple encounters with Great Crested Newt (ie more than just one or two), the whole approach to the construction will be reviewed, and may need to be significantly altered.

The pre-demolition checks will include the whole area around and within the building to be demolished. Within this area, the surveyor carrying out the checks will carefully lift all potential 'refugia', including for example any large stones, slabs of concrete, planks and pieces of timber, pieces of roofing felt or carpet, metal sheet, plastic sheet, sections of pipework etc, and check beneath these for the presence of Great Crested Newt. The inspections will also include checks behind any loose pieces of trim, boarding, cladding, external timbers and rain-goods etc on the buildings themselves, within about 1m of ground level. Once checked beneath and found to be clear, the refugia will be removed from the demolition area.

If found, the Great Crested Newt will be re-covered carefully, taking great care not to cause any crush injuries to it, and left in situ *until a licensed handler is able to attend the site and remove the newt to safety. If this is not possible however, for whatever reason (eg because the refugium cannot safely be replaced, or the newt becomes active and starts to move off), then the on site ecologist may pick up the newt, exercising extreme care, and transfer it immediately to the tall grassland at the edge of the nearest Great Crested Newt compensation pond. No further work or disturbance will then take place in the vicinity of the find-site, until further advice has been obtained as set out above.*

The above requirements will be made known to all members of the contractor's personnel who attend the site, taking care to update any new personnel who may attend after the works have begun.

6.3.2 **Demolition**

Drawing CG/3824/003 shows the demolition phasing and constraints associated with the overall demolition programme.

As a principle, demolition will be carried out under ecological supervision wherever deemed necessary.

6.3.2.1 **Bats**

All buildings confirmed as **bat roosts** will be demolished under Welsh Assembly Government (WAG) licence only. In addition buildings within the groups identified in 6.2.2 above shall also be demolished under licence as bats will tend to move around the site as their roost sites are lost and will occupy adjacent or nearby buildings especially those of similar construction to the roost site.

The surveys undertaken throughout 2007 and 2008 have shown the transient nature of bats at this site and the unpredictable use of buildings by bats, with some buildings being initially classed as of low/limited potential for bats, becoming confirmed roosts following emergence surveys.

In addition, the surveys undertaken and agreed with the Countryside Council for Wales were designed to inform an overall Environmental Impact Assessment over the large built up area of the MOD base. These surveys were based on cordons of surveyors tracking bats back to “hotspots” of activity and from there undertaking dusk – dawn back to back emergence surveys as well as taking into consideration the results of the building inspections.

As the previous surveys will be over 12 months old prior to Phase 1 demolition, and in light of the above information it is recommended that all buildings that have been classed as of high or moderate potential in any of the surveys are re-surveyed for the presence of bats prior to demolition.

All buildings of high or moderate potential for use by roosting bats will require surveys in the active season immediately prior to demolition. These surveys will comprise both internal inspections of the building together with dusk emergence and dawn return to roost watches.

The detailed mitigation set out below is however, based on current survey findings.

6.3.2.2 **Great Crested Newt**

A site- wide WAG licence for the disturbance of Great Crested Newt will be in place prior to any works from Phase 1 demolition onwards, with detailed clearance procedures described in the relevant section below.

6.3.2.3 **Reptiles**

A watching brief will be maintained by the site ecologist during the demolition and construction phases. Detailed mitigation is required for certain areas and is described in the relevant sections below.

6.3.2.4 **Breeding birds**

The timing of operations and mitigation will be as described in Section 5.5 above.

Due to the proposed uses of the site and its proximity to an airfield, no compensation for the loss of bird habitat within the DTC site is proposed.

Phase 1a: Complete by May 2009

Phase 1a comprises specific buildings, 361, 364 and 377 in the south of the site**.** These 3 buildings will undergo decontamination and removal of existing redundant plant. The buildings will then be demolished under Phase 5 demolition.

Building 377 is a confirmed bat roost and any works affecting the roof space, such as asbestos removal must be carried out under Welsh Assembly Government licence.

Building 361 is part of the group of 5 buildings located within the eastern section of the DTC site and should be considered a bat roost as described in Section 6.2. Therefore any works affecting the roof space of this building must be carried out under WAG licence.

Demolition Phase 1: January 2010 – September 2010

Phase 1 demolition is concentrated in the eastern section of the site.
The following buildings are to be removed under this Phase:

293, 296, 320, 322, 323, 324, 325, 325A, 327, 329, 329A, 331, 336, 340B, 487, 540, 542, 553.

6.3.2.5 **Bats**

Prior to any demolition under Phase 1, 2 no. purpose built bat houses will be constructed on the northern and eastern boundaries of the DTC site over the winter/early spring of 2009 / 2010. These buildings form part of the wider whole site strategy for mitigation and compensation for the loss of bat roosts to the development.

Bat Houses 1 and 2 are shown on Drawing CG/3824-001 and will be located either immediately above or adjacent existing underground structures which can be incorporated into the bat house. These first 2 bat houses will be “L”-shaped buildings. One of these buildings will be heated once construction of the DTC site is complete via thermostat controlled heating, to be supplied by either conventional heating or by the on-site biomass heating system.

Building 293 is a confirmed bat roost and will be demolished under WAG licence by the end of February 2010, dependent upon licence conditions.

Building 324, is part of a group of 5 buildings, where it is considered that any of these buildings could be used by bats. This building will therefore also be treated as a roost and will be demolished under WAG licence. Building 324 should be demolished once the bats become active and prior to the end of summer (end of April/beginning of May – late August/early September) unless licence conditions dictate otherwise as it is currently thought that it may be used as a winter roost as well.

All other buildings will require inspection prior to demolition by a licensed bat ecologist to ensure there has been no usage of the buildings by bats since the completion of surveys in 2009. Where buildings show no evidence of use then they may be demolished with caution.

6.3.2.6 **Great Crested Newt**

Phase 1 demolition occurs in the vicinity of the known Great Crested Newt populations. Demolition of the Emergency Water Supply tanks is scheduled for **Phase 2e** subsequent to the Great Crested Newt translocation exercise (see below) and therefore runs concurrently with Phases 1 and 2a – 2d. It is expected that a site-wide WAG licence to disturb Great Crested Newt will be in place prior to the commencement of any demolition under Phase 1.

This license application will be made immediately following the receipt of outline planning permission, should it be granted.

For Great Crested Newt, the following mitigation procedures are proposed to cover demolition phases 1 – 2f (with Phase 2e being the removal of the ponds themselves). Together, these phases are due to run from January 2010 – November 2010 (with the exception of asbestos removal works under Phase 1a).

February 2010:

Install a newt-proof ring-fence around each of the EWS pond enclosures and install pitfall traps on both sides of the fences.
Install lengths of newt - proof drift fences, with pitfall traps on both sides, across accessible areas of suitable habitat in the vicinity of the ponds.
Install large numbers of artificial refugia in the vicinity of the ponds
A 25 metre exclusion zone to construction and demolition will be established around each EWS.
Commence terrestrial trapping, with all newts encountered being transferred to the new receptor ponds at Beggars Pound/West Orchard, south of the runway. The receptor ponds are to remain fenced at this time, to retain the translocated newts and encourage their breeding use of the ponds.

Commence destructive searching to a distance of 10 metres around buildings to be demolished ahead of demolition.

March 2010 onwards:

Commence bottle-trapping of the EWS ponds to capture Great Crested Newts and translocate these to the receptor ponds at Beggars Pound/West Orchard, as above. The bottle-trapping will be carried out alongside the continued terrestrial trapping exercise. Trapping will continue in accordance with the *Great Crested Newt Mitigation Guidelines* (English Nature 2001). In general trapping will continue until at least 10 consecutive clear days of nil return, in suitable weather conditions, have been achieved.

Undertake destructive search of the 25 metre exclusion zone established previously. This will be carried out simultaneously with the bottle trapping.

Once trapped-out, the EWS ponds will then be slowly drained, either by puncturing the lining at the base or by pumping-out. Where pumping-out is used, the pump will either be of an induction type where the water-stream does not pass through the impeller, and with the outlet being screened into a bucket through a 2mm mesh, or the inlet pipe itself will be screened at 2mm mesh and run through two in-line 10lt buckets to allow the settling out and safe collection of any remaining newts, including any juveniles. Once emptied, the pond lining will be carefully broken out using hand-

operated tools only, and the linings lifted in small sections, with each section being checked beneath for sheltering newts. Any significant cracks or cavities in the ground beneath the ponds will also be carefully excavated by hand and checked for sheltering newts, and this approach will also be extended to the clearance of the surrounding bunds and fence-post holes etc. Any Great Crested Newts which are found will be captured and translocated to the receptor ponds at Beggars Pound/West Orchard (see above).

Once cleared, the rubble arisings will be removed from the pond vicinity to a location where they will not be colonised by newts or reptiles etc, and the pond void will immediately back-filled to ground level. The surrounding ring-fences and drift-fences will be left *in situ*, with continued monitoring throughout the remainder of the 2010 newt activity season.

6.3.2.7 **Reptiles**

Demolition phases 1 -1a generally present little impact to reptiles other than through the loss of potential hibernation areas, accidental killing or injury during demolition process. However, a higher probability of reptile activity exists at a brownfield site approximately 20m to the east of St. Brise Church. Mitigation at the brownfield site would involve the destructive searching of habitat and translocation of recovered reptiles at least two weeks prior to the scheduled demolition of buildings. The remainder of the areas affected by phase 1-1a demolition would only require the inspection of buildings immediately prior to demolition conducted in conjunction with GCN mitigation.

For **Phase 2e** however, although surveys have not identified reptile as present at all three emergency water supply reservoirs, the structures present good basking habitat for reptiles. Overall the structures present low potential for reptile; however, demolition will generate habitat loss and the increased risk of accidental killing or injury. Reservoirs will require investigation immediately prior to demolition. It is advised that such mitigation is conducted in accordance with GCN mitigation.

Phase 2a – 2d: June 2010 – November 2010

6.3.2.8 **Bats**

Buildings 344, 397, 398, 400, 401, 303 are confirmed bat roosts and will require demolition under WAG licence.

Buildings 395 and 396 form part of the northern cross-shaped group of buildings identified as probably supporting both Pipistrelle and Brown Long-eared bat maternity roosts. These buildings shall therefore be treated as roosts and demolished under WAG licence. In addition, Building 394, which forms part of this group of buildings, will be augmented to enhance bat use of the roof space as a temporary roost prior to its demolition in Phase 6 (October 2013 – December 2013).

Demolition of the above buildings will need to be undertaken, or at least the buildings will need to have been made uninhabitable for bats prior to the maternity colonies beginning to form. Therefore these operations will probably need to be complete by early April, as once the colony starts forming, disturbance of the bats will not be allowed and demolition will be delayed until the bats have vacated the building for their autumn or winter roosts. It should be noted however, that licence conditions will dictate the timing of demolition or any other operation potentially affecting the bats.

Building 353 is one of the group of 5 buildings considered to collectively form a roost and will be demolished under WAG licence, once the bats are active i.e. from late April to early September unless license conditions dictate otherwise.

Prior to this phase of demolition, the roof space of the current East Gate Guardhouse will be enhanced to allow bat access and use.

Buildings 348, 349, 354, 395, 396, 457, 461, 509, 519, 526, 602, 612 have high or moderate potential to support bats and will be further inspected/surveyed prior to demolition.

6.3.2.9 **Great Crested Newt**

Mitigation in respect of Great Crested Newt has been dealt with in **Phase 1 and 2e** described above.

6.3.2.10 **Reptiles**

Demolition phases 2a -2c generally present extremely low potential for reptiles rising to moderate potential for area 2d. Demolition of phases 2a -2c involves loss of habitat, the potential accidental killing or injury of reptiles and will require the inspection of buildings immediately prior to demolition. This would be conducted in conjunction with GCN mitigation. In addition, a destructive search and translocation of recovered reptiles is required within the area east of St. Brise Church and horse paddock at least two weeks prior to demolition in the spring summer period.

Phase 2f: September 2010 – November 2010

This small phase of demolition is restricted to buildings immediately east of the superhangar and comprises buildings 1004 – 1008, 1018 – 1025.

These buildings are generally of metal frame and metal cladding construction and offer no significant potential to bats. Apart from a watching brief by the on site ecologist no other mitigation is proposed.

Phase 3: August 2010 – December 2010

Phase 3 is concentrated in the north part of East Camp and comprises the demolition of 3 Y-shaped barrack blocks (Buildings 591, 592 and 593), a sub-station (Building 538) and a boiler house (Building 702).

6.3.2.11 **Bats**

None of the buildings have been confirmed as roosts, with Buildings 538 and 702 being classed as having limited potential for bats. The barrack blocks are considered as having moderate potential for use by bats and must be re-surveyed prior to demolition.

During this phase of demolition, Bat House 3 shall be constructed immediately east of the southern T block buildings as shown on Figure ***, prior to their demolition in Phase 4. Bat House 3 shall be of L-shaped construction and heated once

construction of the DTC site is complete via thermostat controlled heating, to be supplied by the on-site biomass heating system.

6.3.2.12 **Great Crested Newts**

The buildings lie close to the former site of Pond 20, cleared under Phase 2e above, but could still have GCN potentially roosting or sheltering in their vicinity.

All demolition and construction from the commencement of Phase 3 demolition (June 2011) onwards will adopt the following protocol in respect of the discovery of Great Crested Newt:

The on site ecologist will undertake checks for Great Crested Newt before the start of each day of work, and this will be logged as a daily action in the site diary;

If a Great Crested Newt is found in any of the pre-demolition checks, no work will be carried out at that location until further expert assistance and advice has been obtained;

The contractors will be vigilant throughout the demolition works, and if a Great Crested Newt is found at any time during the works, all work at that location will cease immediately until further expert assistance and advice has been obtained;

In the event of either of the above scenarios, the contractors will contact the appointed Great Crested Newt advisors for the site immediately, who will attend the site as a matter of urgency to assess the issue and determine the way forward;

In the event of either of the above scenarios, or in the event of multiple encounters with Great Crested Newt (ie more than just one or two), the whole approach to the demolitions will be reviewed, and may need to be significantly altered.

The pre-demolition checks will include the whole area around and within the building to be demolished. Within this area, the surveyor carrying out the checks will carefully lift all potential 'refugia', including for example any large stones, slabs of concrete, planks and pieces of timber, pieces of roofing felt or carpet, metal sheet, plastic sheet, sections of pipework etc, and check beneath these for the presence of Great Crested Newt. The inspections will also include checks behind any loose pieces of trim, boarding, cladding, external timbers and rain-goods etc on the buildings themselves, within about 1m of ground level. Once checked beneath and found to be clear, the refugia will be removed from the demolition area.

If found, the Great Crested Newt will be re-covered carefully, taking great care not to cause any crush injuries to it, and left in situ *until a licensed handler is able to attend the site and remove the newt to safety. If this is not possible however, for whatever reason (eg because the refugium cannot safely be replaced, or the newt becomes active and starts to move off), then the on site ecologist may pick up the newt, exercising extreme care, and transfer it immediately to the tall grassland at the edge of the nearest Great Crested Newt compensation pond. No further work or disturbance will then take place in the vicinity of the find-site, until further advice has been obtained as set out above.*

The above requirements will be made known to all members of the contractor's personnel who attend the site, taking care to update any new personnel who may attend after the works have begun.

Phase 4: May 2012 – July 2012

6.3.2.13 **Bats**

Phase 4 involves the demolition of the southern T block buildings, thought to collectively support a Brown long-eared bat maternity roost and male Pipistrelle roost.

These T block buildings will be demolished under Welsh Assembly Government licence. It is likely that licence conditions will dictate that these buildings are demolished during the winter period prior to coming into use by the bats in the Spring/Summer. Therefore these operations will probably need to be complete by early April, as once the colony starts forming, disturbance of the bats is highly likely not to be allowed and demolition will be delayed until the bats have vacated the building for their autumn or winter roosts.

Other buildings to be demolished in this Phase are: 468 – 470; 479 – 481A; 502, 503 and 703.

Building 468 is considered of high potential for bat use and is of similar construction to the southern “T” block buildings. The building will require further survey prior to demolition. These surveys should be undertaken in 2011.

Phase 5: April 2014 – June 2014

This phase of demolition is concentrated in the southern part of the DTC site.

Buildings 346, 358 – 361; 364, 371, 375, 377, 380, 427, 429, 433, 434, 440A, 460, 477, 520, 706 – 708.

6.3.2.14 **Bats**

Building 377 is a confirmed bat roost and can only be demolished under WAG licence.

Building 361 is part of a group of 5 buildings of similar construction, two of which, are confirmed roosts (including Building 377) and should be considered a roost.

Due to potential/likely use of these buildings in the winter by Pipistrelle bats these buildings will be demolished once the bats have become active and prior to hibernation (late April/May – end of August/early September), unless licence conditions dictate otherwise.

Phase 6: October 2013 – December 2013

Phase 6 is concentrated towards the western side of the DTC site and requires the removal of Buildings, 394, 399, 422, 436, 483, 489, 546 and 616 – 618.

6.3.2.15 **Bats**

Buildings 394 and 399 form part of the Northern Cross shaped buildings, with 399 being a confirmed roost. Building 394, being part of this group of buildings should be considered a roost and additionally it will have been modified to allow bat access as a temporary mitigation measure prior to Phase 2c (April 2010). Both of these buildings therefore will be demolished under WAG licence.

Buildings 422 and 436 have moderate potential to support bats and require re-survey in the spring/summer of 2013 prior to demolition.

Buildings 483, 489, 546, 617 and 618 have little potential to support bats and can be demolished under watching brief.

Phase 7: May 2014 – July 2014

This phase generally comprises "mopping up" a few remaining buildings in the south east and north of the site. Buildings 97A, 508,511 and 441 will be demolished under this phase.

6.3.2.16 **Bats**

Building 441 forms part of the group of the southern cross-shaped buildings and is a confirmed bat roost and can only be demolished under WAG licence.

Buildings 508 and 511 have moderate potential to support roosting bats and will require re-survey in the summer of 2013, prior to demolition.

6.4 Construction Phases

6.4.1 Reptiles

Under Enabling Works and Construction phase 1 (Autumn 2010 - Winter 2013), construction of the access at St. Brise Church (Gate 1) will be undertaken and has potential impacts on reptiles.

Slow worms exist in the vicinity of the church of St Brise. Currently, the identified population consists of at least 30 individual lizards that have been non-invasively monitored since the July 2008. The population is highly localised and identified as exclusively occupying the immediate ~10m south facing church yard. This unkempt church yard strip situated to the front of the church comprises of tussocky grassland interspersed with masonry structures and bordered by bramble. Monitoring of these animals within the strip proved challenging with the ample *in situ* refugia, such as tussocky grass and masonry, proving to be more desirable as basking locations than the artificial refugia offered. No slow worms have been identified occupying the north facing church yard or in any immediate local external to the church yard wall with locations deemed unsuitable for prolonged occupation by lizard from excessive shading and dampness.

Mitigation would be dependant on the extent of restoration to the church. However, the most attractive and cost effective mitigation strategy would be to accommodate the reptile population *in-situ* whilst maintaining or further developing (through bramble clearance and strimming) suitable habitat for the reptiles, their prey and offering a more attractive entrance to the church of St Brise. During works the slow worm

population would be restricted in movement with the erection of a reptile resistant fence enclosing the occupied strip from the parameter of the church yard wall. Such fencing would also inhibit immigration of Great Crested Newts and will be erected in collaboration with proposed mitigation for this species.

However, as construction proposals incorporate an intact church and yard within a new 'island' entrance to the base, consideration must be given to the connectivity of the resident reptile population to that of its meta-population. A small access grid elevated ~15cms from an angled substrate and flush with the surrounding road scheme would assist natural drainage whilst facilitating gene flow between migrating reptile populations. This low cost mitigation would also accommodate Great Crested Newt migration.

Ideally the works in this area should be organised such that there is no excavation works within the affected area. If that cannot be achieved then the slow worms will need to be translocated. No licence is required for this exercise and there are no special requirements applying to this translocation except that the translocation should be undertaken by a qualified reptile ecologist. However, due to the habitat composition and subterranean nature of slow worms this would be a lengthy, expensive and unnecessary mitigation strategy. Such mitigation would be further complicated by the lizard's occupation of existing graves and surrounding masonry. With slow worms occupying such a small containable area it is strongly advised to retain the animals *in situ*. The extent of the population is understood through the monitoring of the population and no delays or complications to works are envisioned.

Should translocation be unavoidable mitigation would involve the tinning of the church yard to recover surface reptiles with refugia requiring to be laid at least 2 weeks prior to reptile utility and commencing of survey. Morning and afternoon tin checks (under favourable weather conditions and at the discretion of a reptile ecologist) would facilitate capture and consequent removal of reptiles to a suitable receptor site. Surface recovery would cease following 10 consistent visits where reptiles were not recovered. Grave stone masonry, bramble and tussocky grassland would then be examined by hand for refuge by reptile with materials removed from the mitigation area.

Finally, with removal of potential refugia, herbicide would remove the remaining vegetation from the affected area surrounding the church and a final tinning regime would attempt to recover the remaining subterranean reptiles. As slow worms will naturally disperse from disturbed habitat; mitigation would encompass the entire church yard and incorporate a 10m buffer zone.

7. Defence Technical College: Picketston

7.1 Construction Information

Demolition of a few existing buildings within Phase 2d (as described in Section 6 above) is to take place from Summer 2010 to make way for the proposed sports facilities and hotel.

Construction within this part of the site will require the diversion of part of the Boverton Brook.

7.2 Summary of Ecological Survey Results for the DTC Site (Picketston)

7.2.1 Habitats

The phase 1 habitat survey revealed that the area contains a small variety of habitats that includes arable land and amenity, improved and semi-improved grasslands, scrub and scattered trees.

The hedgerow survey identified two hedges, on the north-west boundary, considered to be 'important' under the 1997 Hedgerow Regulations.

Three hedgerows were considered species-rich (excluding the "important" hedgerows).

7.2.2 Bats

Three buildings with evidence of previous use by bats are present in this part of the site. The Picketston Guardhouse was surveyed in 2007 and *Myotis sp.* Bats were recorded exiting the building.

Bat activity over the area is low, but the area is nonetheless used by commuting and foraging bats. Species include Common pipistrelle (the majority of activity), Soprano pipistrelle, and rarely Noctule and *Myotis sp*.

Three trees in this section of the site are considered of high potential for use by roosting bats with 14 trees considered of moderate potential.

7.2.3 Great Crested Newt

Great Crested Newt is not known to occur in this area, and there are no suitable breeding ponds present either within the site or in the surrounding areas to the north. The Boverton Brook and the Nant y Stepsau are considered likely to form significant barriers to terrestrial movement to this species, as is the Eglwys Brewis Road.

7.2.4 Badger

Conclusive signs of badger activity were identified in the form of badger hair on a fence.

7.2.5 Otter

Otter have been identified on the Boverton Brook immediately south of the Picketston site and therefore should be considered to use the part of the brook within this area of the DTC site.

7.2.6 Breeding Birds

A moderate variety of bird life was recorded during the breeding bird survey. Species included Bullfinch, Kestrel, Linnet, Reed Bunting, Skylark and Song Thrush, all listed S.42 with Skylark and Song Thrush being listed as UKBAP species.

7.2.7 Reptiles:

Areas of the site are suitable for reptiles and surveys revealed the presence of small numbers of slow worm within the area.

7.2.8 Invertebrates

The invertebrate survey recorded a diversity of species, reflecting the habitats and plants available. These included Small Heath butterfly (*Coenonympha pamphilus*) and the August Thorn (*Ennomus quercinaria*) and Figure of Eight moths (*Diloba caeruleacephala*). These species appear on the list of Species of primary importance for the conservation of biodiversity in Wales (Section 42 NERC Act).

7.3 Detailed Mitigation for the DTC Picketston Site

7.3.1 Habitats and Hedgerows

No compensation for the loss of the general habitats on this section of the site is proposed.

It is anticipated that as the 2 important hedgerows occur on the boundary of the development that they can remain in place. Similarly, 2 of the species-rich hedgerows are shown as being retained within the development, forming part of the external training area.

The remaining species-rich hedgerow will be lost to the construction of the sports pitches. This hedgerow should be translocated to the northern boundary of the Picketston site, at the proposed Hilo Pole Field. A method for hedgerow translocation is provided in Appendix B.

7.3.2 Bats

Buildings 854 and 870 are identified as previous roosts and for the purposes of this report will therefore be treated as roosts and demolished under WAG license.

Building 869 contained evidence of limited use by bats and requires re-survey in the spring/summer immediately prior to demolition.

Bat House 4 will be constructed on the western perimeter of the Picketston area close to the proposed Field Training Area, as shown on Drawing CG/3824/001 prior to the demolition of Buildings 854 or 870.

Buildings 265, 855, 858, 862, 863, 868, 870 – 873, 877, 878 and 893 have moderate to low potential for use by bats and will require re-survey in the spring/summer prior to demolition.

Buildings 580, 583, 763, 777, 848, 853, 856, 859, 864, 865, 867, 874 – 876, 881, 882, 885, 887 – 889, 891 and 892 have little potential to support bats and can be demolished under watching brief.

Three trees within the area have a high potential for use by roosting bats although they are retained within the design.

7.3.3 Great Crested Newt

No specific mitigation measures are proposed during the demolition or construction phases, although these stages will proceed under the supervision of the site ecologist and where there is considered to be any elevated risk of encountering this species, appropriate measures will be implemented (see demolition protocols described in Section 6).

As part of the wider mitigation for this species, however, some five new ponds will be constructed around the western, northern and eastern perimeter of the development site, and one existing but heavily silted pond to the south-east will be restored to water-holding condition. These ponds will all lie within a narrow boundary corridor of terrestrial habitats running around the site perimeter, outside of the security fence, which is suited to use by Great Crested Newt. The new ponds will be installed during the main construction phase.

In addition, newt underpasses will be provided at several locations under the minor roads lying to the east and west, giving access under the roads allowing dispersal to the east, north and west. Newt underpasses with stop-grids will be installed along the line of the proposed newt exclusion fence, where this either crosses the existing Eglwys Brewis Road or has new roads or accesses installed through it.

The site security fence is anticipated either to comprise the existing fence, or a new fence to be installed along a similar line. At installation, and following the construction of the new perimeter ponds, a permanent newt exclusion fence will be installed along the base of the security fence, in accordance with the specifications provided by EN (2001). This exclusion fence will tie-in with the new underpasses and stop-grid sections etc.

7.3.4 Badger and Otter

Evidence of use of the Picketston area by badgers was identified during the surveys that took place in 2007. No setts were found, but badger pathways suggest the area is used for foraging at times. Previous surveys identified 2 badger setts within the Picketston area with feeding signs and latrines.

Prior to works in this area of the DTC site, a further badger survey should be undertaken to ensure no new setts have been established.

Surveys of this watercourse have identified otter use of the main part of the brook and therefore they can be assumed to be using the section of brook to be diverted. Although no holts or resting places were identified anywhere along the Boverton

Brook, a walkthrough survey should be undertaken by a suitably qualified ecologist immediately prior to works in this area.

During demolition and construction works the precautionary measures outlined in Section 5 must be employed to ensure both badgers and otters are not inadvertently injured.

Vegetation removal, including grass/herb cutting should be carried out in late winter/early spring to avoid the bird breeding season except where this contradicts the felling protocol in respect of bats. Ideal timing would be to remove the vegetation in September / October, after bird breeding, prior to reptile and bat hibernation.

7.3.5 **Breeding Birds**

Site clearance operations etc. to comply with the advice given in Section 5.

No compensation measures in respect of birds is proposed due to the proximity of the airfield, although the provision and management of the Field Training Area is likely to be beneficial to both ground nesting and scrub nesting birds.

7.3.6 **Reptiles**

Surveys have identified slow worm as occupying this area with the high potential for use by other reptile species. Consequent habitat manipulation at cleared areas would discourage migration of reptiles into the area from surrounding habitat. The reptile mitigation will require the translocation of recovered animals to the Castleton receptor site. This accommodates both the reptiles' immediate requirements whilst facilitating their natural expansion into the wider area.

7.3.7 **Invertebrates**

It is envisaged that invertebrates will continue to use the undeveloped areas such as the External Training Area in the northern part of the site.

7.3.8 **Biodiversity Enhancement**

Although the southern part of the Picketston site will be redeveloped as sports facilities, the continued low key management of the northern part of the site together with the introduction of ponds will increase invertebrate diversity, attract other amphibians for insect prey, in turn providing prey and habitat for grass snakes and otters.

8. Defence Technical College: Castleton Field Training Area (FTA)

8.1 Construction Information

The area is to undergo minor landscape modifications to allow its use as a military Field Training Area. This will be achieved through earth mounding and planting.

The existing access track will be extended culminating in a parking area. An emergency access will be created from Castleton Farm Road at the south of the site.

Significant planted buffer zones will be in place along the northern, eastern and southern boundaries of the site.

A 10 metre buffer zone will be maintained around the known Great Crested Newt pond.

8.2 Summary of Ecological Survey Results for Castleton FTA

8.2.1 Habitats and Hedgerows

The Phase 1 habitat survey revealed that the Castleton Farm FTA generally comprises arable land and improved grassland, with the semi natural broadleaved woodland along the eastern (Oxmoor Wood) and southern boundaries (Rills Valley Wood). East of the proposed FTA lies the River Thaw.

Twelve hedges were considered to be 'important' under the 1997 Hedgerow Regulations

8.2.2 Bats

Seventeen of the trees were considered to have high potential for providing roosts.

A relatively high level of bat activity, totalling 295 passes was recorded at Castleton over three surveys.

8.2.3 Great Crested Newt

A small stone-lined cattle drinking pond in the centre of the area holds a small population of Great Crested Newt. No other Great Crested Newt populations have been found in the FTA area or its surrounding vicinity. It is likely that the course of the River Thaw, to the east, creates a significant landscape boundary to any movement further eastwards by this species.

8.2.4 Otters and Badgers

High levels of activity were observed in the Thaw valley area including a well used otter holt and other possible resting sites.

Signs of badger activity were found in several places throughout the Castleton Farm survey area. Two outlier setts were located in Oxmoor Wood and Rills Valley Wood, with a further disused sett in Rills valley wood. Other evidence including latrines and badger hairs were indicative of areas and pathways used by badgers. Many mammal runways were also identified.

8.2.5 Breeding Birds

A variety of bird life was recorded during the breeding bird survey. The diversity of birds reflects the different habitats present within the Castleton Farm area. Overall 62 species were recorded, many of them listed as UKBAP, S.42 and/or Vale of Glamorgan LBAP species. These included Bullfinch, Grey Heron, Kestrel, Linnet, Skylark and Yellowhammer.

8.2.6 Reptiles

Slow worms were found, mainly around field margins and ruderal areas.

8.2.7 Invertebrates

The invertebrate survey recorded a wide diversity of species, reflecting the habitats and plants available.

8.2.8 Other Species

Other species recorded included Polecat and Common Toad, both listed as UKBAP and S.42 species.

8.3 Detailed Mitigation

8.3.1 Habitats and Hedgerows

"Important" and species-rich hedgerows will be retained within the development, though the boundary hedgerows will be incorporated within the proposed buffer planting.

Any buffer planting adjacent to or incorporating the hedgerows and semi-natural broadleaved woodlands must comprise native, indigenous species, and of local provenance.

8.3.2 Bats

The proposed use as a Field Training Area will lead to a less intensive management regime than is currently employed over the Castleton area, enhancing the ecological potential of the site providing a greater abundance of invertebrate prey and cover for bats.

Night time training exercises over the site will cause periodic disturbance to bats, although it is considered that, in time the wide buffer planting areas at the boundaries will provide compensation foraging habitat.

8.3.3 Great Crested Newt

As elsewhere, all works within this area will be covered by the site-wide WAG licence for the disturbance of Great Crested Newt.

During the clearance and construction stages, details of which are not currently available, the existing Great Crested Newt pond will be protected within a buffer zone of undisturbed habitats at least 10m in radius around the pond. This buffer zone will

be demarcated on the ground by means of Heras fencing or other suitable fencing which will prevent inadvertent access by site personnel or vehicles.

Once the extent of earthworks for the construction of the FTA is known, a detailed procedure for the trapping-out and/or temporarily exclusion of Great Crested Newt from the construction area will be produced and will form part of any licence application.

As part of the wider mitigation strategy for Great Crested Newt, five new ponds will be constructed around the northern, eastern and southern perimeter of the FTA site. The new ponds will be installed during the main construction phase of the FTA. In addition, a section of newt-proof fence will be installed along the southern boundary of the adjacent SFA and residential property to the north, but otherwise the terrestrial habitats of the completed FTA and the remodelled golf course will be open to use by Great Crested Newt. The new newt underpasses under Eglwys Brewis Road will provide connectivity with habitats and ponds along the eastern perimeter of the DTC site and at St John's Valley to the south-west of the road. The terrestrial habitats of the FTA will be incorporate measures in the landscaping and ongoing management to maximise the benefit to Great Crested Newt.

Any new infrastructure routes (eg internal roads or main vehicle tracks) will be equipped with underpasses at intervals to allow Great Crested Newts to cross safely below surface level.

8.3.4 **Otters**

Disturbance to otters should be minimal due to the planted buffer zones employed adjacent to the Thaw and Rills Valleys.

No specific mitigation is proposed in respect of otters as neither the Thaw Valley, Oxmoor Wood or the Rills Valley will be used for training.

8.3.5 **Badgers**

Badgers use the site for foraging and outlier setts (though not recorded as recently used) are found within the proposed FTA.

Badgers are likely to be intermittently disturbed by night time training exercises but the outlier setts will be adequately protected from interference by the surrounding proposed buffer planting. Planting in the vicinity of the setts should maintain a clear distance of 10 metres from the sett.

No further specific mitigation for badgers is proposed for this part of the DTC development.

8.3.6 **Reptiles**

Mitigation proposals involve the tinning and exclusion of reptiles from the centre of the site with recovered animals translocated to the adjacent hedged corridors during the Spring prior to earthworks commencing. "Tinning" refers to the laying of artifical refugia such as roofing felt, which reptiles will bask on or under. The reptiles are then captured and translocated to a suitable receptor area. The margins of the construction area will then be maintained to make them inimical to reptile colonisation.

Following completion of the required earthworks and any associated construction, reptiles will be allowed to recolonise the site.

8.3.7 Breeding Birds

Apart from general disturbance during training operations, no impacts are expected for birds. Any required earthworks will be undertaken following site clearance of grassland or scrub/hedgerow outside of the breeding season.

8.3.8 Invertebrates

It is envisaged that the invertebrate assemblage will continue to use the site. The majority of invertebrate interest was associated with hedgerows, woodland edge and filed margins. These are unlikely to be affected significantly.

8.3.9 Biodiversity Enhancement

The current arable and grazing farmed land limits biodiversity, generally retaining it to the field margins, hedgerows and the adjacent woodland, saltmarsh and river habitats.

The proposed use of the site as a Field Training Area provides many opportunities to increase the biodiversity resource of the area. As a result, land previously used for agriculture will be less intensively managed and encouraged to revert to more species rich grassland containing a higher diversity of plants and animals.

The driving of military vehicles over the site also provides opportunities to incorporate features to attract amphibian, reptile bird and insect usage, through the creation of wheel ruts and scrapes.

Training activities will create a mosaic of tussocky grassland and bare, scarified ground creating further features and microhabitats both enhancing and increasing the carrying capacity of the site for a variety of species. The new planting, woodland edge and open mosaic grasslands will be of particular importance for butterfly species such as Pearl Bordered Fritillary which occur at the Castleton site as they depend on these varied open areas for movement between different colonies and for food.

The construction of the Great Crested Newt compensation ponds will encourage a range of herptiles (amphibians and reptiles) to the site including frogs, toads, newts and, as a consequence of increased prey species, grass snakes. In addition, the ponds will accommodate a wide variety of invertebrate species.

The 10 metre wide planted buffer zones will provide a wildlife corridor along the North and Eastern edge of the site extending to 50m along the southern border. This planting will provide a buffer to minimise disturbance to mammals such as otter, badger and polecat. Once mature, the planting will provide additional habitat for polecats, which are known to occur at the site.

This fringe corridor will incorporate many features attractive to wildlife including scrub mosaic, tussocky grassland and hibernacula. The creation of hibernacula enhances the site carrying capacity for reptiles through both the increase of over wintering facilities and the expansion of south facing basking features. The hibernacula will

also benefit amphibians and the south facing basking features will attract invertebrates.

Hibernacula will be covered with a soil substrate and generally allowed to vegetate blending in with the surrounding environment. A number of reptile hibernacula would be constructed from native hardwood log piles offering additional benefits to insect populations and, as a consequence, the potential for reptile food recourses are increased. A range of piled dead wood at all stages of decay will provide a range of habitats for more specialist saproxylic (dead wood) invertebrates. Piled dead wood provides shelter and overwintering sites for adult ground beetles (*Carabidae sp.*), pill-woodlouse (*Armadillidium pictum*), as well as essential habitat for the developing larvae of saproxylic invertebrates such as many rove (Staphylinidae) and longhorn beetles (*Cerambycidae spp.*).

9. Aerospace Business Park (ABP)

9.1 Construction Information

The actual phasing of ABP works will be dependant on tenant take-up. Currently the following programme is envisaged:

9.1.1 Phase 1 – 2011 to 2014.

The first phase of development will comprise the construction of new hangar N1 on ABP North, with a replacement compass swing, new engine running facility, replacement fire training facility at ABP South. The Adour test unit and aircraft vehicle parking would also be relocated to ABP South. Some existing buildings on both ABP South and ABP North would be reused in the short term. All these works will be accessed from the Northern Access Road as described below. It is also proposed to demolish some principal buildings in phase 1: buildings 211, 137, 222, 545, 732 and 733 on ABP North and buildings 5, 8, 11, 386 and 497 on ABP South. In addition surplus excavated material from Northern Access Road, Gileston - Old Mill and St Athan B4265 Junction upgrade will be deposited in fill areas on the south side of the runway. Access to these filling works will be via a temporary access off the "C" class road running from the B4265 to Batslays just north of the existing railway bridge.

9.1.2 Phase 2 – 2014 to 2020.

The second phase of development will comprise the development of ABP South, with the provision of hangar S1 together with the refurbishment and extension of Batslays Farmhouse to provide an administration centre. Access to ABP South will be from the new Southern Access Road. Hangar N2 would also be constructed on ABP. These works will be undertaken as dictated by tenant take-up over the Phase 2 period. The development will necessitate the demolition of principal buildings 22, 64, 125, 182 and 208 on ABP North.

9.1.3 Phase 3 – 2020 to 2028

For the third phase, the development of ABP North would be completed with the provision of two further hangars N3/4 and N5, a small aircraft hangar N6, and some non-runway infill development. Further development is proposed at ABP South, some non-runway related, but with three small aircraft hangars. A new air traffic control tower and fire station would be provided on ABP North. The development will necessitate the demolition of principal buildings: buildings 48, 205, 215, 217, 232 on ABP North and buildings 283, 385, 406, 413, 456, 600, 601 and 602 on ABP South.

9.2 Summary of Ecological Survey Results for ABP Site

9.2.1 Habitats

Habitats to the north of the runway comprise amenity grassland and buildings.

Habitats south of the runway, outside of the current Batslays Farm, were similarly of low ecological value and comprised amenity grassland, scrub, trees and buildings/concrete. To the south of the runway however, within St Johns Valley a belt of scrub woodland runs along the valley. This well-structured woodland is considered to provide excellent habitat for a number of species.

The habitat value of Batslays Farm was also considered low, comprising arable land, improved grassland, broadleaved plantation, woodland, scrub, hedgerows and standing water (ponds). No hedges surveyed within the Batslays Farm area qualified as "important" under the Hedgerow Regulations and no species-rich hedgerows were identified.

9.2.2 **Bats**

Three buildings north of the runway within the ABP area were identified as bat roosts – Building Nos. – 211, 217, 228

Four buildings south of the runway were confirmed as roosts – 5, 11, 12, 388

No roosts were confirmed at Batslays Farm, although the farmhouse itself is considered as of high potential for use by bats.

No trees north of the runway were suitable for use by roosting bats.
Three trees at the eastern end of the runway were considered as of high potential for use by roosting bats.
Four trees within the Batslays Farm area were considered of high potential for use by bats.

Bat activity over the ABP area as a whole was low, the majority of activity being from Common Pipistrelle, with some activity of an unidentified bat species and very low (single) Noctule activity.

9.2.3 **Great Crested Newt**

Batslays contains two stone-lined cattle ponds in the field to the south, both of which support breeding populations of Great Crested Newt. One of these populations is of moderate size, but the other is assessed as being small. Both populations appear to have remained fairly static in numbers through the survey period 2002-2008. Newts are known to move from the southernmost pond into the wooded corridor of the adjacent railway line. The corridor of the railway line, and possibly also the wooded corridor of the B4265 which runs more-or-less parallel with it, is assumed to represent a significant movement corridor for GCN running east-west through the airbase area. The railway line and the carriageway of the B4265 themselves, however, are thought likely to represent significant barriers to north-south movement in this area. No Great Crested Newts have been found south of the B4265 road in the airbase area, even though ponds are present which appear potentially suitable for this species (eg at Sea View Farm).

In addition, a newly constructed pond just to the east of Batslays, inside the airbase, originally created in 2007 to act as a receptor pond for newts from the East Camp EWS ponds, has been colonised by Great Crested Newt in the interim and now supports a small breeding population.

9.2.4 **Badgers**

One badger pathway was confirmed in the Batslays survey area to the north of the railway line and within the proposed ABP development. Several holes/burrows were found although none of these could be positively attributed to badger.

9.2.5 **Birds**

A moderate diversity of bird life was recorded throughout the ABP area. Only Skylark a UKBAP and S.42 species was confirmed as breeding in the ABP North area, but a number of species listed as UKBAP and/or S.42 were confirmed as breeding in ABP South including Bullfinch, Skylark, Song Thrush and Yellowhammer.

9.2.6 **Reptiles**

A slow worm population was confirmed in the Batslays area.

9.2.7 **Invertebrates**

The invertebrate survey recorded a low number of common species mainly within the Batslays area. These species included the following S.42 moth species: Hedge Rustic, Figure of Eight and August Thorn.

9.3 **Detailed Mitigation for ABP Site**

No habitats of ecological value, as habitats within their own right (i.e. of intrinsic value) will be lost to the ABP development.

The belt of scrub woodland bordering West Orchard / St John's Valley will remain and forms part of the Ecological Mitigation/Enhancement Corridor. This corridor incorporates compensation ponds and will provide connecting habitat for numerous species with the railway corridor as well as dark flight lines for bats.

Phase 1: 2011 – 2014

9.3.1 **Bats:**

Construction of the Engine Running facility (B2) will require the demolition of Building 11, which is a confirmed Common pipistrelle male roost.

Building 5, also a confirmed pipistrelle roost will be demolished under this phase.

On the northern part of the ABP site, Building 211 is demolished under this first phase. This building is another confirmed Pipistrelle roost.

These buildings will be demolished under WAG license and the replacement roost, Bat House 5, will be constructed adjacent to the railway corridor within the mitigation area south of the development as shown on Drawing CG/3824/001 Bat House 5 will be an L-shaped bat building.

Bat House 4 on the western edge of Picketston, constructed during the DTC development will also serve as advanced mitigation for the loss of Building 211 particularly.

Building 217 (confirmed roost) remains in place throughout this phase.

The Batslays Farmhouse and associated buildings are considered as of high potential for use by bats and as such will require re-survey prior to the proposed refurbishment works under this phase.

It is proposed that the refurbishment works to the farmhouse include enhancements to the roof and roof space allowing access and use by bats as part of the overall mitigation and enhancement strategy.

Further advanced mitigation is proposed by enhancing Buildings 338 and 339 allowing the roof space of both buildings to be used by bats. Building 338 is a pair of unoccupied semi-detached dwellings, which are currently used by low numbers (single) pipistrelle bats. It is proposed that these houses are converted, under WAG license, to a bat house as part of the overall strategy. Their location (Identified collectively as Bat House 6) is shown on Drawing CG/3824/001.

9.3.2 **Great Crested Newt**

No specific mitigation measures are proposed for Great Crested Newt during the demolition or construction stages of this phase, although these stages will proceed under the supervision of the site ecologist and where there is considered to be any elevated risk of encountering this species, appropriate measures will be implemented (see demolition protocols in Section 6). It is also possible that some areas will be subject to advance clearance methods, such as 'fence, trap and clear' operations, 'species deterrence' and/or 'destructive searching'.

9.3.3 **Badgers:**

Construction of the Compass Swing within this phase and further development within Phases 2 and 3 will have a minimal effect on badgers, removing a relatively small area of sub-optimal foraging habitat.

During construction the measures as outlined in Sections 5.3 and 5.5 will need to be employed to ensure no accidental injury to Badgers. These measures include:

Ensuring any deep excavations are fenced against badgers where they are to be left open overnight.

Site compounds and materials storage (such as concrete pipes) are located in areas away from the identified badger path.

9.3.4 **Reptiles:**

It is probable that the slow worms are using hedgerow, road and railway line corridors. Mitigation in this area would ensure connectivity with the meta-population and would compliment the proposed GCN mitigation within this area. Mitigation would include the fencing off and preservation of connecting corridors prior to works commencing. In some instances tinning may be required to translocate reptiles to fenced corridors, but would again work in concordance with GCN mitigation.

Reptile clearance will also be needed south of the railway, prior to the deposition of fill from the construction of the Northern Access Road and the Gileston to Oldmill Improvement within the fields between the railway and the B4265. The clearance here will take the form of habitat manipulation driving reptiles to the railway corridor itself. The area will then need to be fenced against the re-colonisation by reptiles.

9.3.5 **Breeding Birds:**

Site clearance operations and demolition etc. to be in accordance with Section 5.5 of this report.

Due to the nature of the proposed development no on-site compensation is proposed for birds for this phase.

Phase 2: 2014 – 2020

9.3.6 **Bats:**

Existing Building 5, will be lost to the construction of the Southern Access Road during this phase of the ABP development. This building is a confirmed bat roost – likely to be a single male Pipistrelle roost. Demolition of this building will be undertaken WAG license.

Compensation for the loss of this roost is undertaken by the construction of Bat Houses 5 and 6 as described in 9.3.1 above.

Two trees classed as of high potential for use by bats are potentially lost to the Southern Access Road within the ABP South site. These trees will undergo climbing and/or emergence surveys in the season prior to the construction of the road if they are to be affected.

The construction of the Southern Access Road will have the potential to disrupt bats using the railway corridor as a commuting route, particularly through the introduction of road lighting.

The lighting shall be directional and shall be equipped with backshields to prevent light spillage. The bridge over the railway shall be kept dark ensuring a corridor of allowable movement to bats. To offset this impact, the majority of bat activity recorded over this area is confined to low numbers of Pipistrelle and a single Noctule, which are not light shy species.

9.3.7 **Great Crested Newt**

No specific mitigation measures are proposed for Great Crested Newt during the demolition or construction stages of this phase, although these stages will proceed under the supervision of the site ecologist and where there is considered to be any elevated risk of encountering this species, appropriate measures will be implemented (see demolition protocols in Section 6 above etc). It is also possible that some areas will be subject to advance clearance methods, such as 'fence, trap and clear' operations, 'species deterrence' and/or 'destructive searching'.

9.3.8 **Reptiles:**

Construction of the Southern Access Road will have impacts upon reptile populations especially the railway crossing and the tie-in to the existing farm access road.

Mitigation will comprise reptile clearance and fencing from the proposed construction areas through habitat manipulation and translocation to unaffected side of the permanent Great Crested Newt Fence.

9.3.9 **Breeding Birds**

Section 5.5 of this reports details mitigation in respect of breeding birds. No compensation for the loss of bird habitat is proposed here due to the nature of the development.

No other species are expected to be affected by this phase of the development.

9.3.10 **Invertebrates**

The majority of good invertebrate habitat will remain as part of the scheme. This generally relates to the ecological corridor along the south of the airfield at St John's Valley.

9.3.11 **Biodiversity Enhancement**

St John's Valley incorporates a variety of attractive habitat for insects and reptiles including West Orchard castle ruins, tussocky grassland, stone and rock piles, scarified bare ground, dead wood features and path fringe edge vegetation and basking platforms.

Although the existing castle grounds and additional rock piles may support overwintering reptiles and insects the inclusion of further purpose built hibernacula will greatly increase the carrying capacity for these animals. Hibernacula would be covered with a soil substrate and generally allowed to vegetate blending in with the surrounding environment. A small number of reptile hibernacula would be constructed from native hardwood log piles offering additional benefits to insect populations and, as a consequence, the potential for reptile food resources are increased.

A range of piled dead wood at all stages of decay will provide a range of habitats for more specialist saproxylic (dead wood) invertebrates.

In addition to benefiting insect and reptile populations, the same structures would commonly be utilised by amphibians such as Great Crested Newts and Common Toad.

The Great Crested Newt mitigation ponds already constructed will attract other amphibians and invertebrates, providing prey items for a variety of species including grass snake and otter.

Monitoring of habitats and species will be undertaken as described in Section 18.

Phase 3: 2020 – 2028

9.3.12 **Bats:**

Under this final phase of the development Building 217 will be demolished to make way for new buildings 3 and 4. Building 217is a confirmed bat roosts and can only be demolished under Welsh Assembly Government licence. This building is recorded as being used by low numbers of pipistrelle bats:

Building 217 is classed as a Common pipistrelle male roost / mating roost / end of maternity roost.

This building will be demolished in the winter/early spring prior to demolition, unless WAG license conditions state otherwise.

Advanced mitigation in the form of purpose built bat houses (BH 4, 5 and 6) undertaken as part of the ABP and DTC developments are proposed mitigation for the loss of this roost.

9.3.13 **Great Crested Newt**

Areas south of the line of the new southern access roads will be retained, and these include the existing GCN ponds and their surrounding context of terrestrial habitats.

As part of the wider mitigation for this species, however, an additional new pond will be constructed at the eastern perimeter of the development site. This pond will lie within a narrow boundary corridor of terrestrial habitats running around the site perimeter, outside of the security fence or beyond the outer carriageway limit of the new roads. The new pond will be installed at Phase 1.

In addition, newt underpasses will be provided at several locations under the minor St Athan road lying to the east, giving access under the road allowing dispersal to Castleton FTA to the east, and also to the West Orchard Area. Newt underpasses with stop-grids will be installed along the line of the new newt exclusion fence, which will run around the site perimeter and also along the outer carriageway edge of the new southern access road. Access by newts will also continue to be available into the adjacent wooded railway corridor.

The terrestrial habitats of the retained part of Batslays, together with those of West Orchard and Beggars Pound to the east, will be managed to maximise their value to Great Crested Newt.

9.3.14 **Breeding Birds:**

Section 5.5 of this reports details mitigation in respect of breeding birds. No compensation for the loss of bird habitat is proposed here due to the nature of the development.

No other species are expected to be affected by this phase of the development.

Roads and Peripheral Infra-Structure

10. Northern Access Road (NAR)

10.1 Construction Information

The Northern Access entails construction of a new road on a Greenfield site to provide good access from the B4265 at Boverton through to ABP and DTC. Traditional road construction methods will be employed with bulk earthworks (a significant proportion of which will be in rock), bridge construction over Llanmaes Brook, drainage, carriageway construction and landscaping being the major activities. Any surplus excavation from the Northern Access Road will be taken by road (exiting at the new junction with B4265) to the ABP South of the runway where it will be used to reduce a deficit of fill material thereby avoiding use of imported fill material and reducing road haulage.

The online upgrading/widening of the Eglwys Brewis Road will be undertaken in 2 parts. The first part from the new ABP entrance (i.e. eastern end of Northern Access Road) will be constructed at the same time as the Northern Access Road to ensure earliest possible upgraded road access to the new DTC construction entrance at Picketston. The second part will follow on from DTC Gate 2 (construction entrance) around to DTC Gate 1 at Eglwys Brewis.

It is anticipated that the site compound for both NAR & EBR will be at Picketston west where the eastern end of new road intersects with the existing Eglwys Brewis Road thus providing good road access from the commencement of construction activity.

10.2 Summary of Ecological Survey Results

10.2.1 Habitats

The majority of habitat affected by the Northern Access Road is agriculturally improved grassland. Other habitats recorded were; tall ruderal habitat, running water with marginal species and some areas of marshy grassland. Small areas of broadleaved woodland were found in association with the railway and Boverton Brook. Other habitats included arable land, amenity grassland and buildings.

Sixteen hedgerows were reported as “important” as defined by the 1997 Hedgerow Regulations, within the survey area, although only 3 will be affected by the road.

10.2.2 Bats

No actual bat roosts were found in trees in this area although a group of four trees were thought to have a high potential to support bats.

Five species of bat were found to be using the area. These were; Common and Soprano Pipistrelle, Noctule, Lesser Horseshoe, and Myotis species.

10.2.3 Great Crested Newt

No evidence of Great Crested Newt has been found to date in this area, but it is considered likely that this species commutes through the area, and perhaps uses the terrestrial habitats for wintering and/or foraging purposes, possibly following the course of the Llanmaes Brook and other watercourses. There is considered likely to

be some genetic exchange between the Great Crested Newt populations of the airbase and at Batslays, and those to the west of Llantwit Major, although this is probably sporadic due to the distance involved and the presence of barriers such as roads and watercourses. It is probable that the area was itself previously occupied by populations of Great Crested Newt, and that these formed part of a metapopulation which included both the Llantwit ponds and the airbase ponds, but many ponds which might once have been suitable in the area have now either been lost or have become unsuitable for use by this species.

10.2.4 **Otters**

Evidence was found that otters regularly use the Boverton and Llanamaes Brooks.

10.2.5 **Badgers**

Although no badger setts were found over this area, conclusive evidence was found that badgers use this area.

10.2.6 **Dormouse**

Evidence of dormouse was found to the east of the survey area near the entrance to West Camp. No evidence was found within the roadside planting to the west of the proposed road.

10.2.7 **Birds**

The breeding bird survey recorded 40 bird species breeding within the area including UKBAP and/or S.42 species such as Bullfinch, Kestrel, Linnet and Song Thrush.

10.2.8 **Reptiles**

Slow worms were found to be breeding in this survey area, and some areas were suitable for grass snake and common lizard.

10.2.9 **Invertebrates**

Common invertebrate species were recorded species such as grasshoppers and crickets, dragonflies and damselflies, bees, flies and butterflies.S.42 moth species including Cinnabar, Figure of Eight, Garden Tiger and Lackey and Small Heath butterfly were recorded.

10.2.10 **Other Species**

A hedgehog was recorded in Boverton. The hedgehog is a UKBAP species.

10.3 **Detailed Mitigation**

10.3.1 **Habitats and Hedgerows**

The habitats generally affected by the NAR are improved, species-poor semi-improved grasslands, arable farmland, a copse of trees and hedgerows.

Three hedgerows classed as “Important” under the 1997 Hedgerow Regulations will be severed by the NAR. These hedgerows are around 2 metres in height and are

generally intensively managed. A total length of approximately 82 metres of important hedgerow will be affected by the proposed road.

These hedgerows should be translocated to the bottom of the batters of the NAR and incorporated within the proposed landscape planting.

10.3.2 **Bats**

Construction of the NAR has significant potential to affect the movement of bats through this area through the severance of flight lines and the consequent inability of the bats to reach preferred foraging areas.

At least 5 species of bat were detected during the surveys, including Lesser Horseshoe Bat. Lesser Horseshoe bats and the *Myotis sp.* recorded are particularly light shy and will not cross lit areas. In addition, Lesser Horseshoes have a low flight path and are at high risk of road death from moving vehicles.

The only available crossing point for bats along the NAR as it is currently designed, is under the proposed Llanmaes Bridge. This is an appropriate crossing point as the bats will follow the Llanmaes Brook.

The bat activity surveys show that bat use of the area is low but that the existing hedgerows are used for commuting north-south. The recent and the historical surveys have consistently shown bat use of the area to be low. It is considered therefore that augmenting the crossing point beneath Llanmaes Bridge together with the use of deterrent lighting to reduce/prevent crossing elsewhere along the road will be sufficient mitigation.

Standard street lighting columns will be used along the length of the NAR. These columns must be set back at least 20 metres from either side of the Llanmaes Bridge to allow a dark corridor at this point. The provision of lighting along the remaining sections of the road will deter most species of bats from crossing indiscriminately, effectively guiding the bats to the Llanmaes Brook.

The bat activity surveys also show the bats using the existing roadside planting to commute along the B4265. This planting will be severed by the NAR/B4265 junction. Due to the size of this junction it is proposed that bats are deterred from crossing at this point, through the lighting of the junction and diverted to cross under the Llanmaes Bridge.

Five metre belts of dense scrub and woodland shall be planted on both sides of the Llanmaes Brook to link to the existing hedgerow field boundaries north of the NAR as shown on Drawings CG3824/001 and 004.

During construction current flightlines will be kept open for as long as possible through the maintenance of the hedgerow network. Where the hedgerows are severed, fencing, willow hurdles or straw bale walls will be use to join the severed ends of the hedgerows at the end of each working day re-connecting the flightlines during the bats' active season.

Road batters will be planted as soon as practical following their construction, allowing the planting to reach a more mature state prior to the road opening and the street lighting becoming opeorational.

10.3.3 **Great Crested Newt**

The NAR could potentially represent a significant new barrier to the movement of Great Crested Newt west of the airbase, and will enclose part of the floodplain grasslands of the Boverton Brook. The enclosed area will also include a new area of SFA at Tremains Farm and also either side of the new road to the north-west of West Camp and south-west of Pickeston. Surveys to date have not detected any Great Crested Newt in these areas, there being no suitable breeding ponds present. However, it is speculated that there may be at least occasional transfer of Great Crested Newt individuals between the breeding ponds in the airbase area and those to the north and west of Llantwit Major, which lie about 2km away.

The courses of the Boverton Brook and the Llanmaes Brook, as well as the course of Eglwys Brewis Road, all probably represent significant barriers to movement perpendicular to their courses, although longitudinal movement along the wooded railway corridor, the B4265 and the watercourses is both possible and quite likely. The new NAR will cross the Llanmaes Brook with a wide, clear span bridge.

No specific mitigation measures are proposed for Great Crested Newt during the demolition or construction stages of the NAR, although these stages will proceed under the supervision of the site ecologist and where there is considered to be any elevated risk of encountering this species, appropriate measures will be implemented (see protocol set out in Section 6). It is possible that some areas will be subject to advance clearance methods, such as ‘fence, trap and clear’ operations, ‘species deterrence’ and/or ‘destructive searching’.

As part of the wider mitigation for Great Crested Newt, five new ponds will be constructed at various locations either along the western carriageway edge of the NAR, or within the enclosed floodplain of the Boverton Brook. These ponds will lie within a narrow boundary corridor of terrestrial habitats running along the outer carriageway limit of the new roads, which will be continuous with open terrestrial habitats in the undeveloped parts of the enclosed floodplain, and also with open habitats off-site to the west. It is also proposed that one or more new ponds will be installed alongside the railway corridor within the airbase at West Camp, but the precise number and location of these is constrained by the risk of bird-strike and is still under negotiation. These new ponds will be installed at the time of the NAR construction. It is anticipated that the new ponds will allow and encourage the occupation or reoccupation of the land to the west of the airbase, and will strengthen the metapopulation links between the ponds in the airbase area and those to the west of Llantwit Major.

Permanent newt-proof fencing will be installed along sections of the NAR and around associated SFA developments, in order to prevent the movement of newts into the developed parts of the site. Newt underpasses will be provided at several locations, giving access under both the NAR and other existing or new roads to provide connectivity between the new ponds and the retained areas of terrestrial habitat both within the site and off-site. In addition an overpass (ie, a small grassed bridge) will be provided over the Llanmaes Brook where it passes under the NAR, for the same purpose. These structures will all be installed at the time of construction. The retained terrestrial habitats will continue to have connectivity with the wooded corridors of the railway line and the B4265, to the south.

10.3.4 Otters and Badgers

Otters have been recorded as using both the Boverton and Llanmaes Brooks.

The clear span bridge proposed to cross the Llanmaes Brook will have insignificant impacts on otters allowing them to travel the stream and its banks freely.

The provision of the Great Crested Newt mitigation ponds will also attract otters, and the fencing layout detailed below will take this into account.

Otter and badger-proof fencing as specified in the Design Manual for Roads and Bridges (DMRB) Volume 10 should be employed along the entire length of the road where it runs parallel to the Boverton Brook. The fencing shall be set out so as to guide animals to the crossing point beneath the bridge. This layout is shown on Drawings CG3824/001 and 004.

An artificial otter holt is proposed on Llanmaes Brook in the location shown on drawings CG/3824/001 and CG/3824/004. An illustration of an artificial holt is shown in Figure 3.

10.3.5 Dormouse

Impacts on Dormouse relate to the loss of connecting habitat, mainly due to the construction of the large "Y" junction of the NAR and the existing B4265. This junction will cause the loss of a substantial section of roadside planting, which potentially allows dormouse movement along the B4265.

This vegetation shall be cut to a minimum height of 300mm during the winter, with the roots being excavated in the spring following emergence from hibernation and dispersal to appropriate remaining habitat.

Early planting of a 15 metre wide dense scrub belt, (based on Blackthorn scrub) is proposed as mitigation for loss of planting and connectivity along the existing B4265. The scrub planting will run from the railway corridor; along the northern edge of Boverton Brook; continuing along the western side of the Llanmaes Brook; crossing to the eastern side via a planted bridge in order to retain the required width of planting; under the Llanmaes bridge; back across the Llanmaes Brook on a planted bridge (combined with the Great Crested Newt overpass) and back along the northern side of the NAR to reconnect with the existing roadside planting. The layout is shown on Drawings CG3824/001 and 004.

During construction dead hedges could be erected along the line indicated above, or a wall of straw bales covered with brash could be used to provide the connectivity.

Any connectivity currently existing along the railway corridor allowing Dormouse movement will be unaffected by the proposed Northern Access Road.

10.3.6 Reptiles

Reptiles will be cleared from the site area through habitat manipulation, rendering the area unsuitable for reptiles and tinning with clearance of reptiles to the north of the construction corridor. This work would be undertaken during the Spring/summer prior to commencement of the road construction.

Reptiles would remain discouraged from work areas through maintaining short vegetation and the removal of on-site refuge. Orange “power-web” fencing will be erected to illustrate the boundary of reptile habitat to construction workers eliminating the need for extensive reptile fencing.

10.3.7 Breeding Birds

Section 5.5 of this reports details mitigation in respect of breeding birds. No compensation for the loss of bird habitat is proposed here due to the nature of the development.

10.3.8 Invertebrates

Invertebrates will continue to use the semi-improved grassland and hedgerow habitats that are unaffected by the road.

10.3.9 Biodiversity Enhancement

The scrub and woodland edge habitats provided as part of the road landscaping for bats, otters and dormouse will also benefit small mammals, birds and invertebrates providing cover and sheltered flight paths.

The ponds will increase invertebrate diversity, attract other amphibians and in turn, attract grass snake and otters.

11. Gileston to Oldmill Improvement

11.1 Construction Information

The Gileston Old Mill improvement works will be undertaken using traditional construction methods for this type and size of work. Any surplus excavated material will be incorporated into the general filling requirements in the southern part of the ABP.

11.2 Summary of Ecological Survey Results

11.2.1 Habitats

The area generally comprises agriculturally improved grassland. Other habitats occurring include semi-improved grassland, semi-natural broadleaved woodland, saltmarsh, scrub, hedges and running water.

Three hedges were considered to be 'important' under the 1997 Hedgerow Regulations.

Lancadle Road Highway Verge Conservation Zone (HVCZ) lies to the east of the proposed road improvement and disused railway embankment. It is designated by the Vale of Glamorgan Council for its botanical interest and is managed specifically for biodiversity.

11.2.2 Bats

Only one tree was considered to have high potential for use by bats, however, no roost was found.

Four species of bat were recorded on site during bat activity surveys. The bat species recorded included soprano and common pipistrelle bats, Natterer's bat, as well as several passes by unidentified *Myotis* species.

11.2.3 Great Crested Newt

There is no evidence of Great Crested Newt activity in the Gileston to Old Mill area, and the habitats in this area have been assessed as fairly unsuited to this species. No specific mitigation measures are proposed for this species.

11.2.4 Otters

Otter activity is high along the River Thaw and associated tributaries and watercourses.

11.2.5 Badgers

Badger activity was recorded in the Gileston to Old Mill area but no badger setts were found close to the road.

11.2.6 Reptiles

The reptile survey confirmed the presence of slow worm and adder on the site.

11.2.7 Birds

Thirty-one species of bird were recorded that were considered to be breeding within the survey area. These included the UKBAP and/or S.42 species, Bullfinch, Kestrel, Linnet, Skylark, Song Thrush and Yellowhammer.

11.2.8 Invertebrates

Common invertebrate species were recorded species such as grasshoppers and crickets, dragonflies and damselflies, bees, flies and butterflies. The S.42 moths, Cinnabar, Garden Tiger, Lackey and White Ermine were recorded.

11.3 Detailed Mitigation

11.3.1 Habitats

The habitats affected by the road improvement at Gileston to Oldmill are mainly scrub and improved grassland.

Fifteen metres of an “important” hedgerow will be removed at the western end of the improvement at the entrance to a lane.

The proposed footpath at the eastern end of the improvement skirts the edge of East Orchard Wood, an ancient semi-natural woodland bordering the River Thaw. The proposed footway improvement, is to be constructed along the line of the existing registered footpath.

Protection of the woodland edge will be required during construction and will comprise:

- Erection of 2 metre high Herrace Fencing at the canopy edge of the woodland adjacent to the footpath;
- No storage of materials outside of the fenced construction area;
- No lighting of fires within or outside the fenced construction area.
- No refuelling of vehicles in this location

The verge widening at the disused railway embankment to the east of the River Thaw crossing impacts directly on the Highway Verge Conservation Zone (HVCZ) and will result in the loss of a substantial part of the HVCZ to the south of the existing B4265 and a smaller portion of it to the north. The Phase 1 habitat survey undertaken shows the majority of the verge to have been heavily encroached by scrub, impacting upon the grassland species present. It is recommended that the verge is not top soiled during reinstatement but that suitable subsoil is spread and an appropriate species rich grassland is sown as part of the landscape treatment of the new widened verge to compensate for the loss of the HVCZ.

11.3.2 **Bats**

The single tree with a high bat roost potential is outside of the footprint of the proposal and unaffected.

Bats foraging in this area appear to use some of the woodland habitat affected by the scheme as well as habitats on opposite sides of the road. It is possible that bats are flying over the road from one habitat to another, particularly where vegetation is high on both sides of the road. Replacement planting of the woodland and scrub habitat lost will be necessary to allow bats to continue using habitats alongside and on either side of the road.

Bats will continue to be able to cross the B4265 beneath the existing bridge.

11.3.3 **Great Crested Newt**

No specific mitigation measures are proposed during the demolition or construction phases in this area, although these stages will proceed under the supervision of the site ecologist and where there is considered to be any elevated risk of encountering this species, appropriate measures will be implemented (see the demolition protocols in Section 6).

11.3.4 **Otters and badgers**

Mitigation during the construction period shall follow the good practice guidelines outlined in Section 5.3 and 5.7 of this report.

The open nature of the bridge spanning the Thaw will be maintained allowing both otters and badgers to pass freely. Otter and badger-proof fencing will be erected along the length of the road improvement, preventing either species crossing the newly realigned carriageway. This fencing will also return along the access to NPower land and the proposed gate access will be made otter and badger-proof. The fencing layout is shown on Drawing CG/3824/005.

11.3.5 **Reptiles**

The proposed road widening of the B2465 at Gileston will disturb reptile populations distributed along road verge. Generally, mitigation for similar road improvement schemes would involve trapping and translocation, or dispersal of animals out of the development area through habitat manipulation. The area along the Gileston – Oldmill improvement however, is prone to flooding and frequently maintains several centimetres of waterlogged habitat.

In this case, exclusion fencing is not desirable as this will prevent animals seeking dry conditions at the roadside verge. Therefore, a working corridor, to be as narrow as practicably possible should be identified and delineated using Orange" power web/netlon" fencing to illustrate the boundary of reptile habitat to construction workers.

The corridor would be surveyed for reptile activity in the Spring prior to road construction. Affected areas would require tinning and continued habitat manipulation at cleared areas to discourage migration of reptiles into the working corridor from surrounding habitat. Reptiles would remain discouraged from work areas through maintaining short vegetation and removal of any on-site refuge.

Reptiles can then use the section of fenced-verge and disperse further through the works area to the generally unattractive but dry habitat in the event of flooding. Access through this area is required to prevent the animals drowning and although this could temporarily put the reptiles at increased risk of accidental killing / injury it still presents more favourable survival conditions when compared to exclusion fencing.

The removal of sections of the disused railway embankment to facilitate road verge widening east of the River Thaw will result in the loss of a small amount of good reptile habitat and excavations here risk accidental killing or injury of reptiles. Mitigation will comprise habitat manipulation rendering the section of embankment that is to be removed plus a working margin unsuitable for reptiles and driving them away from the working area. This operation would be complemented by “tinning” and reptile removal.

Following completion of the works reptiles would be allowed to recolonise the area.

11.3.6 Breeding Birds

Section 5.5 of this reports details mitigation in respect of breeding birds. No compensation for the loss of bird habitat is proposed here due to the nature of the development.

11.3.7 Invertebrates

Invertebrates will continue to use the hedgerow and scrub habitats that are unaffected by the road.

11.3.8 Biodiversity Enhancement

The reclaiming of the HVCZ to species rich grassland will benefit the invertebrate and reptile assemblages particularly at this location. Appropriate management of the road verge to prevent renewed scrub encroachment will provide biodiversity gain above the current situation.

12. Waycock Cross Junction Improvement

12.1 Construction Information

The Waycock Cross junction improvement works will be undertaken using traditional construction methods for this type and size of work.

The Waycock Cross junction improvement comprises a new roundabout, realignment and widening of the A4226 Port Road West to provide 3 approach lanes, on-line widening of the A4226 Waycock Road (Five Mile Lane) and a 0.5 km diversion of the A4226 Port Road West (east of the junction) to provide a new approach form the east.

12.2 Summary of Ecological Survey Results

12.2.1 Habitats

The Waycock Cross area contains a variety of habitats including semi-improved grazed grassland, deciduous woodland and a small unnamed watercourse.

Barry Woodlands SSSI is located immediately north of proposed Waycock Cross junction improvement.

Walter's Farm Fields within the development footprint are semi-improved grasslands of Site of Importance for Nature Conservation Importance (SINC) quality habitat.

The hedgerow survey confirmed one "important" hedgerow.

12.2.2 Bats

The bat tree assessment examined one hundred and thirteen trees. Nine of these were considered to have high roosting potential, but no actual roosts were found.

At least four bat species were recorded during aerial activity surveys. The bat species recorded included common pipistrelle, soprano pipistrelle, noctule and a *Myotis* species.

12.2.3 Great Crested Newt

There is no evidence of Great Crested Newt activity in the Waycock Cross area, and the habitats in this area have been assessed as fairly unsuited to this species. No specific mitigation measures are proposed for this species.

12.2.4 Otters

An otter survey was carried out along the small watercourse and no evidence of otter was found. There was one hole amongst the roots of a tree alongside the watercourse being used by an unidentified mammal species.

12.2.5 Badgers

There were no signs of badger activity in the survey area.

12.2.6 **Birds**

A moderate variety of bird life was recorded during the breeding bird survey, with twenty eight species recorded as breeding on site, with an additional five species recorded present but not breeding. UKBAP and/or S.42 species included Bulfinch, Linnet, Skylark and Song Thrush.

12.2.7 **Invertebrates**

The invertebrate survey recorded a diversity of species, reflecting the habitats and plants available. Species groups recorded included grasshoppers and crickets, dragonflies and damselflies, bees, flies and spiders. Twenty one butterfly species and forty six moth species were recorded during the surveys. UKBAP and S.42 species include Pearl Bordered Fritillary, August Thorn, Cinnabar, Garden Tiger, Grey Dagger and Hedge Rustic.

12.3 **Detailed Mitigation**

12.3.1 **Habitats**

The habitats affected by the scheme are agriculturally improved pasture, some semi-improved grassland, scrub, plantation woodland, tall ruderal, species poor hedges and ephemeral/short perennial habitats.

The “important” hedgerow at Walters Farm Lane will be severed by the junction improvement. This hedgerow should be translocated and incorporated within the roadside landscape planting.

The eastern leg from the roundabout will result in the loss of part of the candidate Site of Importance for Nature Conservation (cSINC). The road will also fragment the remainder of this semi-improved grassland habitat.

The area of the cSINC supporting the S.42 species Tubular Water Dropwort lies outside the footprint of the proposal to the north and will therefore be unaffected by the road improvement works.

It is recommended that the verges outside those required for landscape planting and bat mitigation are sown with species-rich grassland and managed to encourage a semi-improved grassland habitat.

Areas outside the proposed highway boundary will remain in private ownership and no mitigation, enhancement or management prescriptions are proposed.

12.3.2 **Bats**

No trees identified as having high potential to support bats will be affected by the footprint of the scheme.

The bat activity survey revealed that three or four species use various features on the site for commuting and foraging. The majority of the activity was centred on the more heavily wooded parts of the site, but some hedges also attracted activity. The proposed re-alignment will sever two commuting routes from south of the proposed road to the favoured foraging areas of woodland and scrub to the north. These routes

are the hedge leading up to Walter's Farm and the field boundary hedge to the east of the farm lane.

There is no route available to divert bats around the road improvement and allow access to the woodland and stream foraging areas.

Even though the recorded numbers of bats was low, it is considered appropriate here to provide some form of crossing for bats as at least one species of light shy bat was recorded and it is possible that bats are roosting to the south of the new road.

It is proposed that the proposed 2.4 metre high noise fence, dense roadside planting and street lighting is used to guide bats to the proposed bat crossing point located on the hedge line along the field boundary to the east of the farm access lane as shown on Drawing CG/3824 - 006. At the crossing point on the hedge line, a 1 metre high mesh screen will be erected on top of the noise fence giving a total height of 3.4 metres. Planting along the hedgeline will be built up, culminating at the road edges with the use of larger stock trees such as Extra Heavy Standard trees to force bats up over the road and its traffic. An illustrative detail and layout is shown as Drawing CG/3824/006.

The lighting design shall be such that a 20 metre dark section will be evident at the crossing point. Lights will be equipped with backshields and lighting will be directional.

Bats will be deterred from crossing at the Walters Farm access by the use of directional street lighting, with light being emitted towards the lane itself.

12.3.3 Great Crested Newt and Reptiles

No specific mitigation measures are proposed during the construction or operational phases in this area, although these stages will proceed under the supervision of the site ecologist and where there is considered to be any elevated risk of encountering these species, appropriate measures will be implemented (see demolition protocols described in Section 6).

12.3.4 Otters and Badgers

No specific mitigation is proposed, however the working practices outlined for previous sections should be employed as a matter of course.

12.3.5 Breeding Birds

Breeding birds will be affected by the road itself and the fragmentation of the habitat. The small area to the south of the eastern leg will be disturbed and of no use to ground nesting birds such as Skylark.

The removal of hedgerows throughout the scheme and trees to the north associated with the drainage outfall will remove some nesting and foraging resource. This will be compensated for through the proposed roadside planting.

12.3.6 **Invertebrates**

Generally the habitats at the site were considered valuable for invertebrates with the abandoned agricultural grasslands, scrub and ruderal communities and the unmanaged woodland having a high conservation value for invertebrates.

The grassland habitats will be severed by the road possibly preventing genetic interchange between colonies of Pearl Bordered Fritillary or Garden tiger moth for example.

12.3.7 **Biodiversity Enhancement**

The roadside planting and management of the semi-improved grasslands will benefit biodiversity particularly in respect of birds and invertebrates.

13. Southern Access Road (SAR)

This new road is being constructed primarily to service the proposed Aerospace Business Park and has been considered under Section 9 ABP.

14. Llantwit STW and Waste Water Pipe Run

14.1 Construction Information

The rising main will be constructed from the DTC site over an approximate length of 5.5 km and will require a working area of 12 metres. The route is generally located adjacent to the Northern Access Road and the B4265 although it does also pass through agricultural fields.

14.2 Summary of Ecological Survey Results

14.2.1 Habitats

The Llantwit survey area contained a variety of habitats including semi-natural broadleaved woodland and broadleaved plantation, agricultural grazing land which consists of semi-improved neutral grassland, poor semi-improved and improved grasslands, marshy grassland and marginal vegetation, and the area includes one small watercourse.

Twenty one hedges were considered to be 'important' under the Hedgerow Regulations.

14.2.2 Bats

Six trees were considered to have high roosting potential, but no actual roosts were found.
Five species of bat were recorded - common pipistrelle, soprano pipistrelle, noctule, *Myotis* and unidentified bat species belonging to the vespertilionidae (family).

14.2.3 Great Crested Newt

The surveys identified three ponds containing small Great Crested Newt populations to the north-west and west of Llantwit Major, and at least two others have since been identified in this area by other sources. Some of these ponds lie within 500m of the treatment works. All of the ponds lie 2km or more from the western boundary of the airbase. The occupied ponds comprise a mixture of field ponds (cattle ponds) and garden ponds.

14.2.4 Otters and Badgers

Evidence of otter presence was confirmed along the Llanmaes Brook in the form of otter spraint. It was also noted during the survey that excellent feeding opportunities exist along the brook for otters, but potential holts and resting sites are limited.

Badgers are confirmed as using this area as foraging habitat, although no setts were found.

14.2.5 Reptiles

Slow worms were recorded along the B4265 and grass snakes were observed along the railway line.

14.2.6 Breeding Birds

A wide variety of bird life was recorded during the breeding bird survey. The diversity of birds reflects the different habitats present within the Llantwit area. Overall 43 species were recorded to be breeding. UKBAP and/or S.42 species included Bullfinch, Kestrel, Linnet and Skylark.

14.2.7 Invertebrates

The invertebrate survey recorded a diversity of species including butterflies, grasshoppers and crickets, dragonflies and damselflies, bees, flies and spiders. Twenty-eight moth species were recorded during the moth trapping exercise including the UKBAP and/or S.42 species, Cinnabar, Garden Tiger and Hedge Rustic.

14.2.8 Other Species

Other notable species recorded at the site include Common Toad (UKBAP and S.42)

14.3 Detailed Mitigation

14.3.1 Habitats

The main impacts will relate to the temporary loss of habitat, particularly hedgerows and the overall effect on the wider hedgerow network. Once the pipe is laid habitats can be restored.

14.3.2 Bats

Effects on bats can be negated during construction by reforming the severed hedgerows on completion of work each day, by the use of willow hurdles, fencing or straw bale walls.

As the hedgerows are already generally adjacent to the road, severance is unlikely to cause a problem.

On completion of the works or in a staged approach, hedgerows can be restored to their original connections by planting with native species or translocation of the original hedgerow section.

14.3.3 Great Crested Newts

Works affecting any areas of the new sewer line which lie within 500m of an identified Great Crested Newt pond will be covered by a Welsh Assembly licence, and will be subject to appropriate advance measures to temporarily remove or exclude any newts from the area which is to undergo earthworks. These measures may include ‘species-deterrence’, ‘destructive searching’ and/or ‘fence, trap and clear’ operations, as deemed appropriate at the time.

Any other ponds which are found to lie within 500m of the construction zone for the new sewer line will be protected for the duration of the works within a buffer zone of undisturbed habitats at least 10m in radius around the pond. This buffer zone will be demarcated on the ground by means of Heras fencing or other suitable fencing which will prevent inadvertent access by site personnel or vehicles.

14.3.4 Otters and Badgers

The pipeline route runs parallel to the Llanmaes Brook over much of its length. The measures described in Section 5.3 should be employed, particularly in respect of fencing any excavations that are to be left open overnight.

14.3.5 Reptiles

Habitat manipulation will be required, moving reptiles northwards from the works area. This approach will also be adopted for Common Toad, which was found during the reptile surveys.

The areas will be maintained uninhabitable to reptiles and amphibians and the working corridor will be clearly demarcated to contractors by the use of high visibility fencing such as orange “Power Web”.

14.3.6 Breeding Birds and Invertebrates

The temporary and localised nature of the works will not cause undue effect on either breeding birds or invertebrates and therefore no specific mitigation or enhancement is proposed. Hedgerow removal will be carried out outside of the bird breeding season in order to ensure compliance with wildlife legislation. Where this is not possible, the procedures described in Section 5.5.

Service Families Accommodation (SFA)

It is not proposed to provide any compensation habitat for protected species within any of the proposed SFA sites. This is due to the fact that the developer will not have the required control over operations within those areas once they become occupied. The public pressure on such areas, the threat of vandalism and the potential predation by domestic cats are all valid considerations to provide this habitat elsewhere.

The exception to the above is at Tremains Farm where Dormouse connectivity habitat is proposed.

It is suggested therefore that areas set aside for informal recreation or as public open space are managed to enhance their general biodiversity value through a range of measures such as:

- Planting up areas with wildflower meadow seed will encourage all forms of wildlife particularly insects.
- Retaining areas or features of mature vegetation wherever possible.
- Linking new planting to existing vegetation and also to the wider landscape where possible.
- Mowing of these areas should be less intensive (twice per year). Allowing the grasses and associated flora to flower will provide habitat for butterflies and insects and enhance the areas planted for small mammals, in turn bringing in predators such as barn owl (*Tyto alba*). All arisings from mowing should be removed to reduce soil nutrients and prevent mulching of the grassland.
- Differential mowing regimes should be employed, mowing different areas to different heights providing structural diversity.
- Planting early and late flowering plants provides food nectar for insects at crucial times of year (just before and after hibernation). Early flowering plants include deadnettles (*Lamium* sp.) and honesty (*Lunaria annua*). Late flowering plants include knapweed (*Centaura nigra*) and Michaelmas daisy (*Aster novi-belgii*).
- Night scented species such as tobacco plant (*Nicotiana* sp.) will attract moths and other night flying invertebrates and therefore attract bats to the area.
- Planting annuals which produce many seeds in late summer are a good source of food for birds in autumn and early winter. Plants include cornflower (*Centaura cyanus*), forget-me-not (*Myosotis* sp.) and field poppies (*Papaver rhoeas*). Ivy (*Hedera helix*) should be encouraged on trees and other vertical surfaces as it flowers in winter, providing winter nectar and seed sources for invertebrates, in turn providing foraging opportunities for birds and small mammals.
- Areas of nettles (*Urtica dioica*) should be maintained for invertebrates, particularly butterflies. This will in turn attract birds and small mammals.

- Artificial refugia in the form of log and stone piles placed in the buffer zone would improve the habitat for reptiles, amphibians and invertebrates. Grassland around these areas should be allowed to form tussocks, thus providing further shelter and foraging opportunities for reptiles, amphibians, small mammals and invertebrates.

- Hedges have been used as boundary features wherever possible, especially where it is possible to link woodland and scrub habitats. Hedges should have an associated strip of low intensity management land along its length to promote corridors for wildlife that may not be able to use the hedge itself. This will promote habitat links and encourage small mammals, birds, invertebrates. Consideration should be given to managing hedges by laying rather than flailing. The creation of hedges as well as their maintenance will increase biodiversity levels.

- Planting of native trees and shrubs will usually result in increased biodiversity levels. Species considered to be beneficial include (but are not restricted to) oak (*Quercus robur, Q. petraea*), ash (*Fraxinus excelsior*), silver birch (*Betula pendula*), willow (*Salix* sp.), juniper (*Juniperus communis*), hazel (*Corylus avellana*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), field maple (*Acer campestre*), dogwood (*Cornus sanguinea*), holly (*Ilex aquifolium*), and dog rose (*Rosa canina*).

- Provision of bird and bat boxes (specific to species) should be considered, increasing the ease with which breeding birds, and bats can begin to utilize new habitat.

- Areas of planted or existing scrub should be cut on a rotational basis with around 20% of the area being cut on each rotation, creating structural, species and age diversity.

- Security lighting on houses at the peripheries of the sites should be minimized or at least directional to avoid lighting the surrounding countryside.

Construction Information

The project requires construction of approximately 500 new Service Family Accommodation units to provide living accommodation for the Military Staff required to support the Metrix staff running the new DTC. These houses will be built on sites identified at the Old Stadium/Golf Course area, Picketston Sites north and south of the new Northern Access Road and Tremains Farm.

It is envisaged that traditional house building construction will be employed, although every opportunity will be taken to use modern construction methods such as pre-fabricated elemental construction of internal shell and roofs. Each of the sites will be set-up individually with its own site compound adjacent to the entrance onto the public highway.

All SFA sites will be carried out as one continuous phase commencing 2nd Quarter / 3rd Quarter 2011 (dependant on number of houses at each individual site) and continuing to overall completion end of 2nd Quarter 2014.

Completion of houses at each site will be arranged such that progressive occupations

can commence early 4th Quarter 2013 to coincide with Phase 1 DTC completion and mobilisation of Training.

15. Golf Course Site

15.1 Summary of Ecological Survey Results

15.1.1 Habitats

The Golf course comprises mainly amenity grassland with scattered trees, hedges and an area of derelict land consisting of poor semi-improved grassland.

Two hedges were considered to be 'important' under the Regulations; however, the majority did not qualify.

151.2 Bats

Four bat species were recorded during the bat activity survey. These were common and soprano pipstrelles, noctule and a Myotid species, probably Natterer's bat.

The tree assessment for bats examined four trees. Two of these were thought to have high potential for bat use.

15.1.3 Great Crested Newt

No Great Crested Newts have been recorded on the Golf Course site to date.

15.1.4 Badgers

No evidence of badger presence was recorded at the Golf course.

15.1.5 Reptiles

Access to the Golf course area was not available for a reptile survey.

15.1.6 Breeding Birds

A low variety of bird life was recorded during the breeding bird survey. Overall 19 species were recorded that were considered to be breeding, a further 10 species were found at the site but not considered to be breeding in the area.

15.2 Detailed Mitigation

15.2.1 Habitats

No habitats of intrinsic ecological value will be lost to this SFA development.

One hedgerow defined as important will be lost, but the hedge is not joined to any other feature and so is generally out of context. No mitigation is proposed for this hedgerow.

15.2.2 Bats

No trees of high value to support roosting bats will be affected by this SFA development. One tree of moderate potential for use by bats in the north east corner

of the site is potentially affected. Should this tree require felling it should be surveyed in the Spring/Summer immediately prior to felling.

No specific mitigation in respect of bats is made as the loss of sub-optimal foraging habitat is catered for in the immediate surrounding countryside including the adjacent Thaw Valley and Castleton Farm areas.

15.2.3 Great Crested Newt

No mitigation for this species is proposed here. Protection for the species during construction will be provided by newt fencing along the southern boundary of the SFA site. This is dealt with under Section 8.3.3.

15.2.4 Reptiles

It is anticipated that reptiles will use some areas of the existing golf course for basking etc.

In order to prevent accidental killing or injury to reptiles during construction of the SFA site, reptiles will be cleared to the edges of the proposed development through habitat manipulation and tinning/translocation.

It would be preferable to drive reptiles eastwards towards the agricultural fields. The margins of the proposed SFA development must be maintained unattractive to reptiles through strimming and refuge removal.

The newt fence to the south of the development will also be effective for reptiles.

15.2.5 Breeding Birds

Section 5.5 of this reports details mitigation in respect of breeding birds. No compensation for the loss of bird habitat is proposed here due to the nature of the development.

15.2.6 Biodiversity Enhancement and Management

There are few existing features of biodiversity importance lost to this particular development.

The retention of the hedgerow to the east will remain the main feature for wildlife at this site. Te areas of open space to the west of the development are generally isolated and therefore not particularly conducive to biodiversity enhancement.

16. Picketston South West and North of West Camp

16.1 Summary of Survey Results

16.1.1 Habitats

Habitats found within south west Picketston and north of West Camp include mainly arable fields with some semi improved grassland.
Within these areas six hedgerows (one at south west Picketston and five north of West Camp) are considered to be important under the Hedgerow Regulations 1997 and will be affected by the proposed scheme.

16.1.2 Bats

North of West Camp one tree was considered to have high potential to support bat roosts. South west Picketston 1 tree was also considered to have high potential and four having moderate potential to support bat roosts.

16.1.3 Otters

Boverton Brook lies within the area north of West Camp where recent and old otter spraints were found.

16.1.4 Badgers

Badger activity was recorded within the area although no badger setts were found. Badgers use the area for foraging and commuting.

16.1.5 Birds

A moderate variety of bird life was recorded within the area. UKBAP and Section 42 species recorded include bullfinch, skylark, linnet and song thrush.

16.1.6 Reptiles

Slow worms are the only reptiles found to be present within this area.

16.1.7 Invertebrates

A wide diversity of species was recorded over the whole area and included butterflies, damelflies and dragonflies, grasshopper, crickets, bees and moths. A number of UKBAP and Section 42 species were recorded such as Small heath, August Thorn, Figure of Eight and Hedge Rustic.

16.2 Detailed Mitigation

16.2.1 Habitats

No habitats of intrinsic quality will be lost to these housing developments, the main habitats to be affected being poor semi-improved grassland, arable land and improved grazing land.

The important hedgerows identified at the northern boundary of the proposed SFA area will remain as the boundary to this particular development. Where important hedgerows are lost, it is recommended that they are translocated to the boundary and incorporated within the landscape planting for the site.

16.2.2 Bats

No trees identified as of high value to bats will be lost to these particular SFA developments.

Bat activity across this area was low and no specific mitigation is proposed for these SFA sites.

16.2.3 Great Crested Newts

Great Crested Newt mitigation ponds are shown to the north east and west of the sites. A newt-proof fence will prevent newts entering the SFA areas.

16.2.4 Otters and Badgers

The diversion of the brook running from the north through the proposed sports pitches may impact upon otters and mitigation for this has been dealt with in Section 7.

Prior to commencement of works near the Boverton Brook at the North of West Camp site, walkthrough surveys for the presence of otter will be conducted. Although both Boverton and Llanmaes Brooks are used by otter, there was a paucity of suitable resting places reported in the surveys. The disturbance of otter along these sections is therefore unlikely. However, the working practice requirements detailed in Section 5 should be adhered to during any work on these SFA sites. These working practices apply equally to badgers, which are also present in the surrounding countryside.

16.2.5 Reptiles

Reptile clearance of the site will require habitat manipulation, working from the centre of the development site out to the edges. A “tinning” process will also be required to run concurrently.

Following development, reptiles will be able to recolonise suitable habitat at the periphery of the site and within it.

16.2.6 Breeding Birds and Invertebrates

Apart from the measures described in Section 5.5 to ensure legislative compliance no specific mitigation or enhancement measures are proposed for birds.

The retention of vegetation as described in the section below will retain invertebrate habitat at both sites.

16.2.7 **Biodiversity Enhancement and Management**

Existing vegetation features such as hedgerows have been incorporated into the development at Picketston South West, providing conduits through and around the site for a variety of invertebrates, small mammals and reptiles.

Sections of hedgerows to be lost will be translocated and incorporated into the landscape planting for the developments.

At North of West Camp, the over-mature hedgerow and trees along the southern boundary will be retained facilitating east west movement of species.

17. Tremains Farm

17.1 Summary of Ecological Survey Results

Ecological surveys results generally accord with results for the Northern Access Road.

17.1.1 Habitats

The housing will be built mainly over agriculturally improved grassland and incorporate the Llanmaes and Boverton Brooks at the east and southern boundaries respectively.

Within this area there are two hedgerows classified as important under the Hedgerow Regulations 1997 and a belt of semi natural broad leaved woodland will be lost adjacent to the railway.

17.1.2 Bats

Within this area there are four trees with high potential to support bat roosts and four with moderate potential.

Bat activity was deemed to be low within this area. A Lesser Horseshoe bat pass was recorded along Boverton Brook.

17.1.3 Otters

Llanmaes Brook runs through this area and flows into Boverton Brook. Otter spraint has been recorded at Llanmaes Brook.

17.1.4 Badgers

Badger footprints were found along Llanmaes Brook. While mammals runs were abundant throughout the area this was the only conclusive badger evidence.

17.1.5 Birds

A diverse range of bird species were recorded over the site. UKBAP and Section 42 species included bullfinch, linnet, song thrush and skylark.

17.1.6 Reptiles

Slow worms were the only reptiles found within this area.

17.1.7 Invertebrates

A wide variety of invertebrate species were recorded within the area including butterflies, moths, grasshoppers, crickets, damselflies and dragonflies. UKBAP and Section 42 species found included Small Heath, August Thorn, Figure of Eight and Hedge Rustic.

17.2 Detailed Mitigation

17.2.1 Habitats

The loss of habitats, particularly the broad leaved woodland will be compensated for within the landscape proposals for the site which incorporate substantial planting.

17.2.2 Bats

A number of light shy species of bat commute and forage along Boverton and Llanmaes Brooks. It is essential that these areas are maintained in darkness. Close boarded fencing should be sued at the back of the houses here and security lighting should be restricted and directional to prevent lighting the surrounding area.

17.2.3 Otters and Badger

Otters use both Boverton and Llanmaes Brooks.
During construction the working practices set out in Section 5 should be adhered to.

17.2.4 Dormouse

Mitigation for Dormouse is dealt with in Section 10, Northern Access Road and generally comprises connectivity planting. Due to the landscape and access requirements at the Tremains Farm SFA site, small-scale green bridges have been proposed to cross footways and the Llanmaes Brook.

17.2.5 Reptiles

Reptile clearance of the site will require habitat manipulation, working from the centre of the development site out to the edges. A “tinning” process will also be required to run concurrently.

Following development, reptiles will be able to recolonise suitable habitat at the periphery of the site and within it.

17.2.6 Birds and Invertebrates

No specific mitigation is proposed for birds due to the proximity of the airfield.
Both birds and invertebrates however, will benefit from the landscape planting and informal open space areas proposed as part of the Tremains Farm SFA site.

17.2.7 Biodiversity Enhancement and Management

The design seeks to retain mature vegetation features such as a group of mature trees at the north east of the development. These trees are identified as of value to bats. The group of trees will connect via landscape planting to the edge of the housing development and roadside planting of the Northern Access Road.

These trees will also be of value to birds and invertebrates.

A hedgerow identified as “important” runs through the site. This hedgerow will be retained in part, although in a severed state. This hedgerow will run through the site

linking the tree group to the north to the open space areas south of the development. This is shown on Drawing CG/3824/004.

The Boverton and Llanmaes brooks will be planted with a tree and scrub mix providing a habitat link for Dormouse, as well as cover for otters and flight paths for bats. In addition, this planting will benefit birds, invertebrates, reptiles and small mammals.

18. Monitoring

18.1 Bats

Post development monitoring will be carried out to assess the success of mitigation, and to instigate remedial measures where necessary. Monitoring will be carried out in years 1, 3, 5, 7 and 10; where year 0 is the year of the relevant section of construction.

18.1.1 Summer (maternity roost) monitoring

Summer monitoring will aim to find maternity roosts in all the bat roost mitigation buildings. Monitoring will be carried out on all bat roost mitigation buildings between mid June and mid August and will consist of:

- One daytime internal inspection
- One dusk survey
- One dawn survey

18.1.2 Autumn swarming / mating monitoring September/October

Autumn monitoring will aim to find autumn swarming and/or mating behaviour at the roosts. Monitoring will be carried out on all bat roost mitigation buildings in September or October. The monitoring will consist of:

- One daytime internal inspection
- One dusk survey
- One dawn survey

18.1.3 Winter monitoring

The winter monitoring will aim to establish level of usage of the winter sites and will be carried out on the dual purpose buildings and bat buildings (not the church) in December or January as follows:

- One daytime internal inspection
- Monitoring of temperature and humidity levels within the underground sites and adjustments made to roost conditions where necessary.

18.1.4 Aerial activity monitoring

Aerial activity survey will be targeted at the movement corridors/flight lines and will aim to establish the level of bat usage of the site post development. Activity monitoring will be carried out between late April and end September in years 1, 3, 5, 7 and 10. The monitoring will consist of:

- One two walked transect using frequency division / time expansion bat detectors with recording devices and include post survey call analysis.
- The transects will be spaced throughout the year.

18.2 Great Crested Newts

18.2.1 Monitoring of New and Retained Ponds

All of the ponds within the mitigation scheme will be subject to annual monitoring to be carried out in Years 1, 3, 5, 7 and 10; where year 0 is the year of pond construction. This will comprise survey by means of bottle-trapping on six separate occasions between March to June, with three of these being carried out during the period April to May. This would be supplemented by means of lamping surveys and egg-searching on each survey occasion, where these techniques are viable. The data obtained from these surveys will be used to estimate population size-classes.

18.3 Otters

Post development monitoring will be carried out to assess the success of mitigation, and to instigate remedial measures where necessary. Monitoring will be carried out in years 1, 3, 5, 7 and 10; where year 0 is the year of the relevant development.

18.3.1 Monitoring of artificial holts

The artificial otter holts will be monitored twice yearly to ascertain usage by otter. This will be carried out by placing either wet sand or clay pads at each entrance to the holt, and leaving in situ for a week, to be checked daily. In addition, sticks can be placed at the entrances to the holts and these checked for movement / dislodging by a large mammal. In addition, survey will be carried in the immediate vicinity of the holt to look for other signs of otter occupation / presence, such as feeding remains, territory marking, spraint etc.

18.3.2 Monitoring of resting places

The areas of habitat creation will be monitored to ensure that the habitat is maturing as required and to look for signs of otter, such as spraint. Above ground resting sites used by otter, as determined by pathways and areas of flattened vegetation are unlikely to be distinguishable from those created by other mammals such as badger or fox.

18.3.3 Monitoring of Underpasses / culverts and fences

Monitoring of all underpasses / culverts will be undertaken by using clay pads at one or both ends of the tunnel. Monitoring will be carried out twice yearly, in the spring and in the autumn.

Otter and badger-proof fences shall be inspected quarterly to ensure integrity, with any damaged sections being repaired immediately upon discovery. Where routine inspections of the highway reveal damages to the fences, these should likewise be repaired immediately.

18.4 Badgers

Post development monitoring for badgers is only considered necessary if a licence is required.

18.5 Reptiles

Post development monitoring will be carried out to assess the success of mitigation, and to instigate remedial measures where necessary. Monitoring will be carried out in years 1, 3, 5, 7 and 10; where year 0 is the year of the relevant development.

18.5.1 Monitoring sites

To allow comparative assessment, four sites will be monitored within the MOD St Athans scheme: Officer accommodation nature reserve; St Brise Church; St John's Valley and Castleton translocation sites, areas within the Great Crested Newt ecological corridor. This will also facilitate comparative study between established and translocated populations.

18.5.2 Monitoring methodology

In order to monitor individual reptiles, a database will be assembled consisting of data measurements for weight, length (both total and snout to vent) and photographs of unique dorsal and ventral head pigmentation patterns. In addition, the animal's immediate habitat and GPS position will be recorded.

18.5.3 Post-translocation monitoring of reptiles

The post translocation monitoring of reptiles through recapture and identification, facilitates construction of a detailed record of individual body condition over time and eventually relates to a successful or unsuccessful translocation process qualified by a self sustaining population. As reptiles are long lived animals, determining a successful translocation is unachievable in less than 5 years with a more robust data set requiring 10 years post translocation monitoring.

FIGURES

Fig 1 Rubble and log pile reptile hibernacula

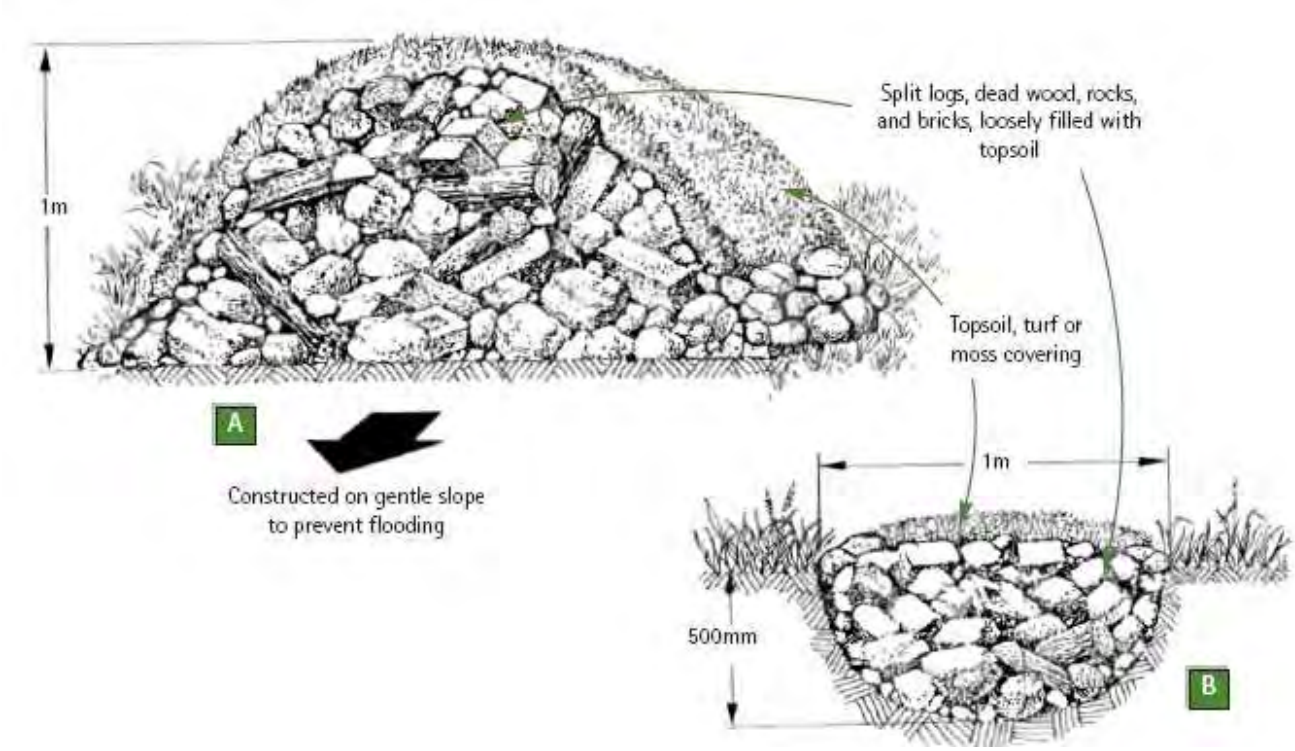


Fig 2 Bat House Illustration

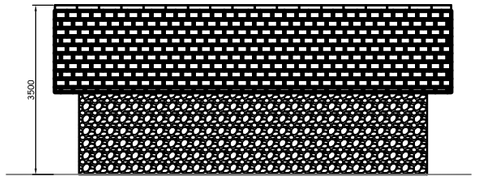
Bat House Specification

The East and West end walls of the building will be concrete block construction with a standard cavity wall. The South and North walls will be constructed with the outer leaf being coursed rubble salvaged from the existing building and the inner leaf being of concrete block construction. The roof will consist of artificial slate and traditional open timber trusses. The roof will be lined with traditional roofing felt. A ceiling will be created using plywood on half of the area at the easten end.
For the exterior wood surfaces, three coats of exterior grade, **non-toxic** water-based black paint will be applied. . Gaps at15mm and more than 20mm will be left between soffits and walls and at gable ends allowing bat access into the cavity wall.
Traditional ridge tiles will be used but the ends will be left open to provide access under the tiles.
The top of the cavity will remain open and gaps of at least 2cm will be left in the blockwork at intervals to the wall cavity.The structure will have no windows, and a small door which will be padlocked (After construction access will only be permissable for licenced personnel for monitoring).

The timber roof frame from pencam A will be salvaged and used to create the roof supports of the new building. The pitch of the roof will be dependent on the angle of the mortice joints in the existing building.

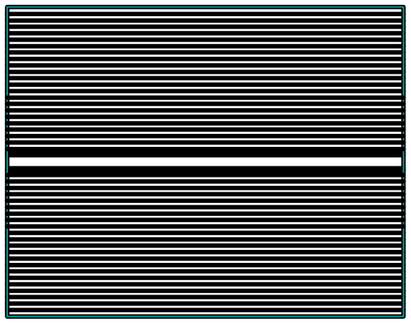
An underground section is to be constructed the length of the building and half the width of the building. this is to be lined with concrete blocks with additional blocks inside to create tunnels of varied humidity and temperature for Bats. Gaps of at least 20mm are to be left between blocks at regular intervals. The access to this underground section is to be through a grill on a dividing wall within the building. This grill is to be fitted with a datalogger for monitoring purposes.

(Reference Figure 4)

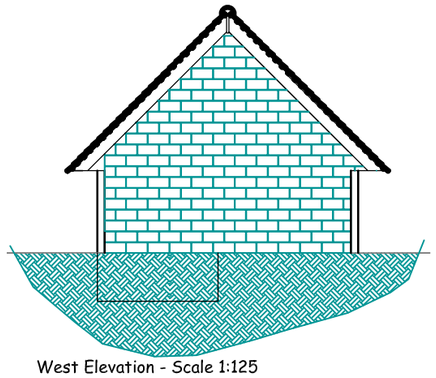


North Elevation - Scale 1:125
(South similar but handed)

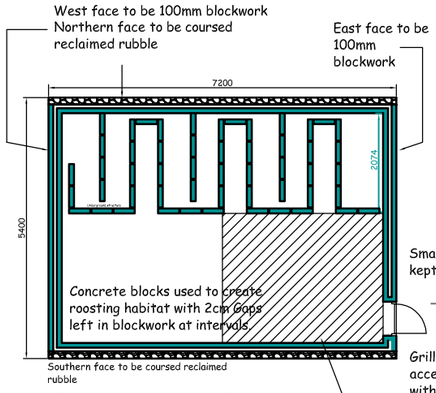
Roof Construction:- Artificial slate nailed to 38 x 25 rough sawn timber battens fixed through one layer bituminus felt with min lap 150mm, south facing elevation with the addition of 19mm timber sarking boards securley fixed to reclaimed timber joists on the north side.
For the exterior wood surfaces, three coats of exterior grade, **non-toxic** water-based paint will be applied. Colour will be black. **Gaps at least 2cm** will be left between soffits and walls and at apex of gable ends allowing Bat access into the building and into the roof cavities.
Traditional ridge tiles will be used but the ends will be left open to provide access under the tiles.



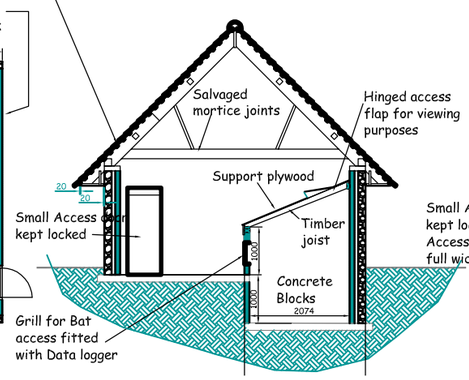
Roof Plan - Scale 1:125



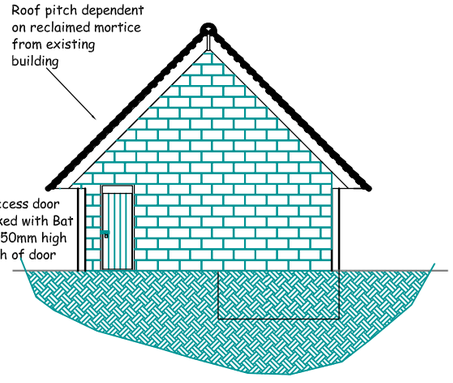
West Elevation - Scale 1:125



Floor Plan - Scale 1:125



Section A - A - Scale 1:125



DRG. No.	FIGURE 2	REVISION REF.

ISSUE	AMENDMENTS	DRAWN	CHECK	DATE

CLIENT

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

PROJECT

DEFENCE TECHNICAL COLLEGE AND AEROSPACE BUISNESS PARK ST.ATHAN

TITLE

ILLUSTRATION OF NEW BAT ROOST BUILDING

PURPOSE

REPORT

CAPITA SYMONDS

Capita Gwent Consultancy Limited
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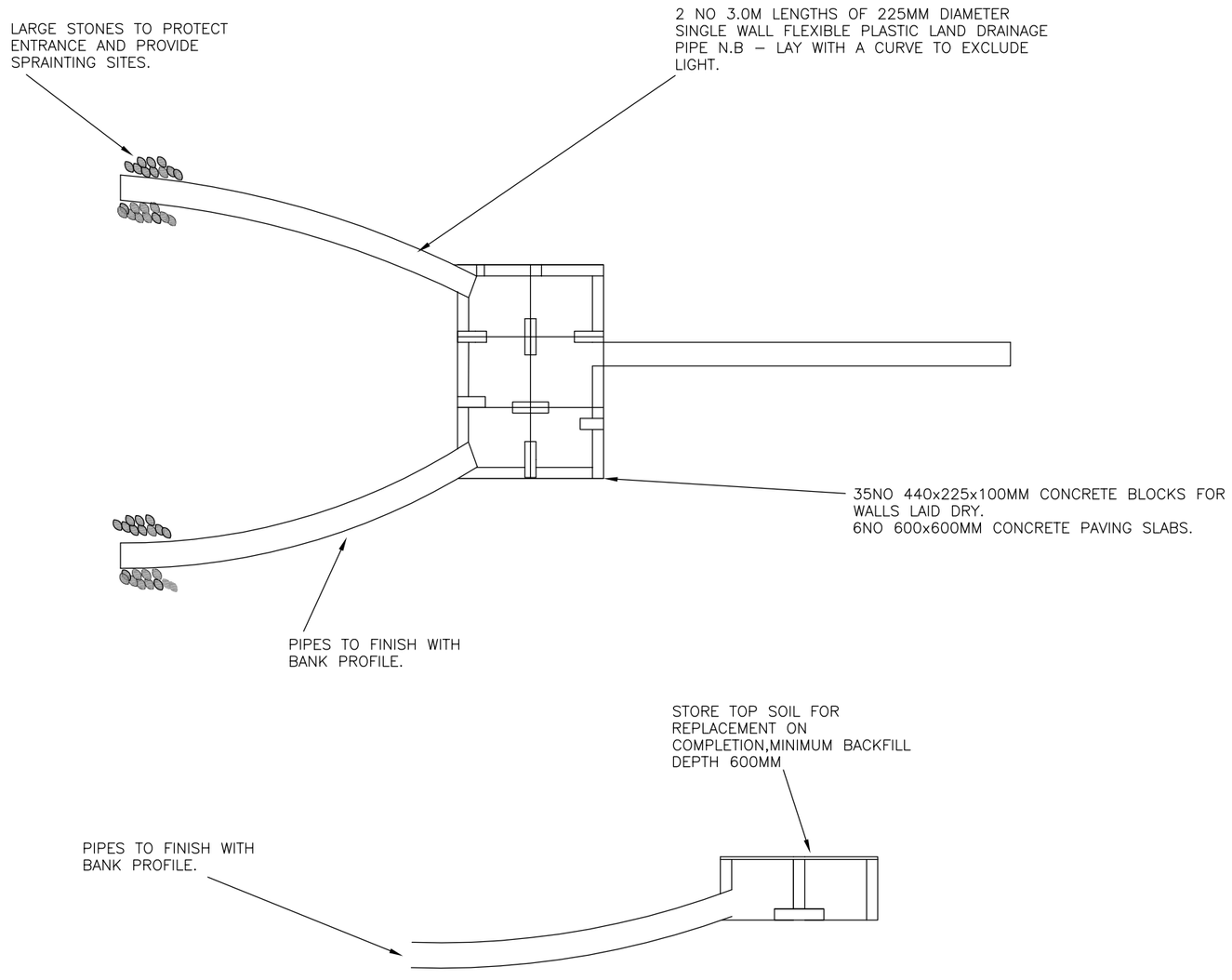
DRAWN	DATE	SCALE
J.D.P	APRIL 09	1:125
CHECKED	DATE	PROJECT No.
G.P	APRIL 09	CG/3824

DRG. No.	FIGURE 2	REVISION REF.

Fig 3 Otter Holt Illustration



DRG. No. FIGURE 3 | REVISION REF.

ISSUE	AMENDMENTS	DRAWN	CHECK	DATE

CLIENT

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

PROJECT

DEFENCE TECHNICAL COLLEGE AND AEROSPACE BUSINESS PARK ST.ATHAN

TITLE

ARTIFICIAL OTTER HOLT ILLUSTRATION

PURPOSE

REPORT

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J.D.P	APRIL 09	NTS
CHECKED	DATE	PROJECT No.
G.P	APRIL 09	

DRG. No. FIGURE 3 | REVISION REF.

APPENDIX A

BEST PRACTICE TREE FELLING PROTOCOL

BEST PRACTICE PROCEDURE FOR FELLING TREES CONTAINING POTENTIAL BAT ROOSTS

Under best practice, this procedure should only be undertaken once the Statutory Nature Conservation Organisation (SNCO) i.e. the Countryside Council for Wales, and/or a licensed bat ecologist has been consulted.

This procedure applies to trees having a potential to contain bat roosts or where a bat roost is found unexpectedly during works. Whenever a tree with a KNOWN roost is to be cleared, it will first be necessary to obtain a licence from DEFRA or WAG and this will carry a method statement detailing how each roost is to be dealt with. In that case it would be normal to fell the tree only at a time when a specialist assessment has shown that bats are not present.

Precautionary Measures

Where trees with potential bat roosts are to be felled, measures to exclude bats and prevent re-entry to the tree/trees should be carried out in advance of felling (e.g. by sealing the hole following inspection by a bat specialist). Except where further use of the potential roost has been prevented, a dawn survey and a thorough inspection of the tree must be carried out a licensed bat ecologist on the morning immediately preceding works. It may be necessary to employ a trained operative to climb the tree or hire lift machinery if the tree cannot be inspected thoroughly from ground level.

Trees identified as containing potential bat roosts should be clearly marked using an enduring medium such as specialist tree marking paint or numbered identity tags in advance, and all those involved in clearing operations on site should be fully appraised of the location of these trees and the need for special procedures to be followed so as to avoid any possibility of unwitting, unauthorised damage to potential bat roosts.

If an inspection leaves no doubt that no bats are present no further precautions are necessary for that hole, provided further opportunity for use by bats is denied (e.g. by felling the tree the same day or sealing the hole).

Timing of operations

Suitable times to complete work on trees which have bat roosting potential are limited as bats are known to roost in trees at any time of year. To reduce the chance of disturbing a roost, especially a maternity roost or winter hibernacula, it is important to avoid work during the summer and winter months.

There are two periods when felling of trees would be least damaging to bats, March through April and late August to early October. The above times avoid the period of deep hibernation and the main breeding season. However, while March and April are suitable months for operations affecting bats, due account should be taken of nesting birds, which are also afforded statutory protection.

Methodology for felling

Detailed advice with regard to a methodology should be obtained through consultation with the SNCO/or a licensed bat ecologist, although the following principles should generally apply:

- Emergency procedures including a contact telephone number for a licensed bat ecologist must be in place.
- Pruning or section felling must, wherever possible, avoid crosscutting in the proximity to cavities and hollow sections.
- Hollow sections of the tree that may contain bats should be secured with rope (usually over a higher limb of the tree), cut off and lowered carefully to the ground where they can be inspected by a licensed ecologist.
- Any hollow sections which can not be fully examined for bats should be removed to a safe area, or the work managed such that trees or parts of trees will not be felled onto them. These sections should then be left on site with any openings exposed, for at least 24 hours, so that anything inside has the opportunity to escape.
- Pruning or section felling must, wherever possible, avoid crosscutting hollow parts of the tree to reduce the potential for injury to bats that may be inside. Informed decisions should be taken on where to make these cuts, based on experience of rot holes etc. and the behaviour of bats.
- Split limbs that are under tension may need to be wedged open to prevent their closure when pressure is released.

Once these sections have been dealt with the remainder of the tree can be felled in the normal way.

In some cases, such as when a potential roost occurs in a main trunk, it may not be possible to rope the section such that it can be lowered gently. One alternative is to secure it to the butt just below the intended cut, so dropping it onto the rope rather than the ground. Another is to fell the tree such that the impact with the ground will be minimised, perhaps by felling it up slope.

Dense ivy cover in itself offers roosting opportunities for bats, and may also conceal roosting cavities present within the tree. Dealing with trees that have ivy growing up them will really depend on what work is proposed and how much of the trunk and branches are covered. Where the tree is covered in dense ivy growth, the ivy cover will need to be checked as thoroughly as possible and removed by hand prior to the felling of the tree. Where this is not possible, it may be practical to consider felling the tree, on the basis that the thickness of foliage will soften the fall and reduce the impact of shock

Replacement roosts

Where a tree with roosting potential has to be felled, the branches and limbs containing possible roost sties could be strapped to an adjacent tree in a similar location.

Bat boxes or bat houses may be provided to replace the roosts that are lost during development. Normally they should be installed in time to allow bats a summer season to become familiar with them before destruction of the existing roosts begins. In any case they

should be fully installed no later than the commencement time of these works. Their design, number and location should be considered by a bat specialist in the context of the overall development proposals and roosts lost. It is important that such replacement roosts are favourably sited both for access by bats and for conditions at the roosts. The bat box/ house installation should be designed to persist over many years to continue to provide bats with alternative roosts into the future.

Emergency Measures

If a bat roost is confirmed immediately prior to/ during felling, stop works IMMEDIATELY and contact the SNCO/ licensed bat ecologist for advice on how to proceed. The contact details for the relevant organisations and individuals should be given to the contractors on site before works commence.

Sometimes a roost may be discovered only after operations have begun and have reached a stage where it would be unsafe to leave the limb or tree part way through the operation. Active bats are likely to fly off promptly as a result of the disturbance. It is best to avoid bats flying off in the day as they may fall victim to birds of prey. Ideally, both active and torpid bats should be captured by the bat specialist and transferred into shelter, such as a bat box fixed to a tree, in a safe area nearby. Bats should never be handled without wearing gloves to avoid the risk of bites.

Bats found should be transferred to a suitable shelter as soon as possible. If they need to be retained temporarily by the licensed bat expert it is important to ensure that a secure, quiet place that will not overheat is available and that the safety of the bats can be assured even though they may be unattended for a time while operations continue. A vehicle is generally not suitable for this purpose in hot or sunny or very cold weather when it is difficult to maintain reasonable temperature conditions. The holding time should be kept to a minimum to avoid stress to the animals.

APPENDIX B

METHOD STATEMENT FOR HEDGEROW TRANSLOCATION

Hedgerow Translocation

The hedgerows should be retained if possible. If this is not possible it is better ecologically to translocate the hedgerow rather than remove it entirely.

If a hedgerow is to be translocated then the following procedure should be used:

- The hedgerow should be securely fenced prior to contractors arriving on site and left undisturbed until sections to be translocated are moved to prepared receptor sites.
- Prior to the translocation the hedgerow should be cut back to the base.
- An excavator should be used to dig out the woody components of the hedge to an appropriate depth and width to ensure a good rootstock.
- Translocation of the hedgerow ground flora can be undertaken by transferring topsoil and turf with the minimum disturbance possible to an adjacent pre-prepared donor site. This could be done by hand or by an experienced machine operator. Again, this process is best undertaken within the same day and copious watering is required.
- It should be transferred on the same day to a pre-prepared receptor site (preferably in an adjacent location). It is imperative that the roots are kept well watered both during the operation and for several weeks afterwards.
- Translocation should be carried out from November to late February, by transferring the cut back hedgerow, topsoil and turf with appropriate care to an adjacent pre-prepared receptor site.
- New lengths of hedgerows consisting of a species rich planting mix of local provenance should be added to the translocated hedgerow to achieve no net loss of species-rich hedgerow on the site. Species should reflect the most characteristic species composition found on site.
- Areas, including hedgerows that are to remain in situ, should be securely fenced prior to contractors arriving on site and left undisturbed during development.
- Hedgerows will need to be managed in the long term to prevent deterioration over time by periodically trimming (every 2-3 years in the winter) and laying (every 8-10 years in the winter) or coppicing (every 8-10 years in the winter).
- There should be periodic monitoring of the hedgerows every 2 years for 10 years with the results used to inform management practices.

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Appendix F
Landscape Baseline and Evaluation

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Introduction

Entec has been commissioned to undertake a landscape and visual assessment of the proposed development at St. Athan. A full scheme description is given in chapter 3.

The purpose of this appendix is to set out the baseline landscape features of the site and its surroundings, potential landscape receptors, and to identify those receptors that may be subject to significant effects as a result of the proposed development.

Only those receptors which could potentially be subject to significant effects are included in the Landscape Assessment at Chapter 7 of the main report.

Following a description of the study area adopted for collation of the landscape baseline, the remainder of this appendix reports the results of the Baseline Studies, as follows. Results are reported for the site and also for the wider surrounding landscape:

- Landscape elements (i.e. trees, hedgerows, buildings), pattern and scale within the Development Site;
- Landscape Designations and Conservation Areas;and
- Landscape Character, with commentary on pattern and scale, night time lighting and also drawing upon published material relevant to both the site area and wider landscape.

The sensitivity of identified landscape receptors is then summarised to inform the Landscape Assessment in Chapter 7.

Method

Study Area

For the purposes of this assessment, the development site has been split into the following sections. The ‘Main Site’ is the term used to describe the following features of the development site:

- Defence Training College;
- Aerospace business Park;
- Northern Access Road;
- Southern Access Road;
- All of the Service families Accommodation sites;
- Gileston to Oldmill road improvements;
- St.Athan junction improvements.

The following study areas have been adopted, taking account of the location and scale of development:

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- A 3km study area has been adopted surrounding the development site, which includes the Defence Technical College (DTC), Service Families Accommodation (SFA), Aerospace Business Park (ABP), northern and southern access roads, in and immediately surrounding the site of the MoD base. This is referred to as the 'main site' within the remainder of this chapter. The 3km study area also encompasses the proposed upgrades to Gileston to Oldmill Road improvements. The improvements to the St.Athan junction are not reported on here as they take place within existing highway limits and will not alter any existing landscape elements;
- To enable assessment of the waste water pipeline, a 1km area either side of its route has been adopted. (Construction activity associated with the new pipeline will temporarily be a new feature of the landscape, although the scale of the activity has not been judged sufficient to require a broader study area);
- A separate 1km study area has been adopted surrounding **Waycock Cross**, where a new roundabout some 32 metres in diameter, plus approximately 100metres of new carriageway is proposed to its north and 200metres off line to the east.

Desk Study

Table F1 sets out the data sources used to determine the location of any potentially sensitive landscape receptors.

Table F1 Data Sources

Topic	Source of Information
Landscape character	LANDMAP data for Vale of Glamorgan (CCW website http://landmap.ccw.gov.uk)
Non-statutory designated sites, Tree Preservation Orders	Vale of Glamorgan Unitary Development Plan adopted 2005
Townscape character	Conservation Area Appraisals for Conservation Areas within the study area
Regional planning policy, potential future landscape change	Landscapes Working for the Vale of Glamorgan January 1999
	Technical Advice Note 10: Tree Preservation Orders
	Technical Advice Note 12: Design
	Technical Advice Note 14: Coastal Planning
Landscape pattern, land uses	1:25,000 digital mapping for the Vale of Glamorgan and surrounding area;

Site Visits

The proposal site including Waycock Cross and the study area were visited on a number of occasions with comprehensive notes and photographs taken to allow a clearer understanding of the landscape context into which the proposed development would be placed. This included a night time assessment undertaken on the 28th February 2009. The landscape immediately surrounding the site was visited between the hours of 18.30 and 21.00 to assess the sources of

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night time lighting from the site and also from the surrounding area. The night time site visit did not include the Waycock Cross area.

Landscape Designations and Conservation Areas

Landscape Designations (see Figure 7.1 and Figure 7.2)

Policy ENV 3 Green Wedges Barry, Rhoose and St.Athan

This policy covers a section of the landscape to the south west of the existing Waycock roundabout and extends as far soth west as Cardiff airport. The policy states that 'the spread of development into the countryside, which can result in urban sprawl, incremental loss of open land and lead ultimately to the coalescence of settlements, can have a detrimental effect upon agriculture, the landscape and amenity value of the land and can unacceptably erode community identity.' The proposed development would not in fact be located within this designation. The proposed development involves moving the roundabout approximately 100metres north, thereby taking the roundabout further away from this landscape designation.

Policy ENV 4 Special Landscape Areas (Thaw Valley Sides) -Vale of Glamorgan Unitary Development Plan (2005)

This policy covers a small area of the most eastern section of the Main Site. It covers an area of approximately 1 square kilometre, coinciding with the section of the site allocated for the development of an external training area at Castleton and an area of Service Families Accommodation (known as the Golf course SFA site). In addition, the landscape designation also applies to the land to the north of the proposed Gileston to Oldmill upgrades and also to the west of the Waycock Cross roundabout

Although the landscape is designated to protect the wooded valley sides, site visits confirmed that within the site of the proposed Service Families Accommodation, in the far north eastern part of the red line boundary, the site is not wooded, and unlike further to the east, there is not a sense of a steeply sloping landform which forms the valley sides.

There are no other areas of the proposed development that coincide with landscape designations.

Policy Env5 Glamorgan Heritage Coast

An additional landscape policy which applies to the wider study area is Policy *Env 5 Glamorgan Heritage Coast* from the Vale of Glamorgan UDP, immediately south of the proposed ABP.

The aim of this policy is to protect the landscape of the heritage coastline within the Vale of Glamorgan. The coastline is designated for its scenic beauty and the scientific interest of its geology, ecology and cultural heritage.

The designation applies to a strip of coastline to the south, extending from a point immediately south of the proposed southern access road junction, as far south as the coast line. The designated coastline extends only to Aberthaw Power station in the east, approximately 2km south east of the proposed southern access road junction. The designation extends westwards, beyond the 3km study area.

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Trees and hedgerow

The Main Site

Preliminary tree surveys were completed for each of the 22 parcels of land within the Main Site, in compliance with BS5837: 2005. The surveys have been completed by 'Amenity Tree Care Limited'[1] [2] (hereafter referred to as the arboricultural survey). The trees were classified according to the desirability of their retention. The classification relates the amenity conferred by each tree and is based on the assumption that development will occur on the site. Table F2, below, summarises the tree category definitions adopted. The tree survey also identifies the location of hedgerows throughout the land parcels, although site visits confirmed that not all of the hedgerow is identified. Additional assessment of the contribution of the hedgerow network as a whole to the landscape pattern is made under the heading 'Landscape pattern and scale' below. Chapter 6 (ecological assessment) makes an assessment of the hedgerows with regard to the Hedgerow regulations 1997.

Table F2 Tree Category Definitions (based on BS 5837:2005)

Amenity Tree care tree survey (October 2008) Tree category	Tree Category Definition
Category A	**Those of high quality and value:** in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested)
Category B	**Those of moderate quality and value:** those in such a condition as to make a significant contribution (a minimum of 20 years is suggested)
Category C	**Those of low quality and value:** currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested) or young trees with a stem diameter below150mm
Category R	Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management

There are many trees on the Main Site. Some of these trees have amenity value individually, as defined by the arboricultural surveys, whilst others are in groups that have value in contributing to the wider landscape character.

The results of the tree survey (including the Categories applied to each tree and hedgerow) are shown graphically in the following documents and summarised in Table F3 below:

- 'Aerospace Business Park, St Athan: Statement in support of the planning application';
    - Drawing 341 – Aerospace Business Park –Tree Survey;
    - Drawing 342 –Aerospace Business Park, Vegetation retained and removed;

[1] Preliminary Tree Survey Compiled in Contemplation of Development, Amenity Tree Care Ltd., July 2007

[2] Preliminary Tree Survey Compiled in Contemplation of Development, Amenity Tree Care Ltd., July 2007

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- Drawings L.251 – L255 - DTA St. Athan Access to South of the Runway, Existing Tree Survey Condition Survey and Retention;
- L351-L353 – DTA St. Athan Gileston to Oldmill – Existing Tree Condition Survey and Retention;
- L451 – L.452 – DTA St.Athan – Waycock roundabout – Existing Tree Condition Survey and Retention;
- L151-L.159 – DTA St. Athan Northern Access Road – Existing Tree condition Survey and Retention.

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- TF: L03 Tremains Farm Tree Survey;
- TF: L04 Tremains Farm Vegetation Retained and Removed;
- NWC: L03 North of West Camp Tree Survey;
- NWC: L04 North of West Camp Retained and Removed;
- GC:L04 Golf Course Tree Survey;
- GC: L05 Golf course Retained and Removed;
- PSW: L04 Tree Survey;
- PSW: L05 Picketston South West Retained and Removed.

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Table F3 Main Site: Preliminary Tree Survey Results

Land Parcel	Results
Land parcels with the ABP including the sotehrn access road. The results of the tree survey are shown graphically on the figures listed above within the Aerospace Business Park, St Athan: Statement in support of the planning application'	
Airfield	There is a sparse cover of trees within this area. Those identified by the tree survey are located along the boundary with the B4265 and Llantwit Road, a number of small groups of trees between housing at Higher End (A-G5, A-G8 and A-G7 as defined by the tree survey), and on the northern edge of the airfield strip, south of East Camp. Approximately 70% of the trees in this area are categorised by the tree survey as being Category C, however, there are three groupings of trees which are defined as being Category B. These trees are marked on Drawing 341 of the document 'Aerospace Business Park, St Athan: Statement in support of the planning application' as A-G23, A-T2 and A-G19.
Batslays	A short band of Category B trees are located to the north and south of the railway line, to the south west of this land parcel. All other trees marked on the tree survey are located along the boundaries of fields as hedgerows e.g. B-H1 and B-G3 as shown on Drawing 341, and are categorised by the tree survey as being Category C trees.
Area 22 and 46	This area is separated into three parcels by mixed species hedgerow which is judged to have a Category C retention value. Two groups of trees are judged to have a Category B retention value. One group is located to the south of the land parcel adjacent to Eglwys Brewis and the other is located in the northern section of the land parcel adjacent to the settlement of Pickeston.
F3	Trees within this area are minimal. They are restricted to three groupings of Category B trees to the far south of the land parcel, and one individual Category C tree F3-t2 as shown on Drawing 341 of the document 'Aerospace Business Park, St Athan: Statement in support of the planning application'
Land parcels within the DTC. The results of the tree survey are shown graphically on the figures listed above within the Design and Access Statement for the Defence Training College	
Castleton	Trees in this area include a broad band of mature trees along the course of the River Thaw (Category B), and individual trees within hedgerow field boundaries.

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Table F3 (continued) Main Site: Preliminary Tree Survey Results

Land Parcel	Results
DTR Inside the wire (including land parcels DTR IW1, DTR Iw2, DTR IW3, DTRIW4	Trees within this area are found primarily along the boundaries with the surrounding pastoral field and residential land uses. Examples include trees to the north east of the DSG hangar, on the southern side of Eglwys Brewis Road (G12, G11 and G10 as defined by the tree survey) and group G4 (marked as G4 on the DTR IW3 land parcel arboricultural survey) on the north western edge of Picketston. Other groups of trees are planted as landscape buffers e.g. G6 and G5 as defined by the tree survey for this land parcel. The majority of the trees are Category C reflecting their low arboriculture value including poor overall form and condition, or minor contribution to amenity value. However, some areas of Category B tree s do exist along the boundaries, and these trees have a good level of amenity value. A notable example is north of Picketston, where the value of the group of mature trees is recognised by its TPO designation.
East Camp	Trees in this area line the roads which cross the landscape to create a grid pattern and are also found in small clumps adjacent to buildings. Other trees mark the boundary between East Camp and Eglwys Brewis. Trees on the site are approximately 50% Category B and 50% Category C. There are three small clumps of trees which are suggested for removal.
Road 2	Vegetation in this area is predominantly hedgerow which marks the field boundaries. Small groupings of trees are located in the corners of fields and occasional trees are located within the hedgerow. The entire hedgerow is judged to be of Category C retention value. One hedgerow tree in the centre of the land parcel is categorised as Category B as is a small grouping of Fraxinus Excelsior in the south of the land parcel.
Land parcels applicable to the SFA sites. The results of the tree survey are shown graphically on the figures listed above within the Standard Families Accommodation, Design and Access Statement	
DTR outside the wire	Trees in this area are largely within hedgerows (hedgerow trees) and lining sections of road that cross the land e.g. B4265 and the railway line where it crosses the south western edge of the site. A group of Fraxinus Excelsior trees (G7) in the northern section of the Tremains Farm SFA site is defined by the arboricultural survey as being Category B as are the trees to the south of the Tremains Farm SFA site (G2 as shown on Drawing TF:L03 of the document 'Aerospace Business Park, St Athan: Statement in support of the planning application) and a small grouping (G15 as shown on the same drawing) in the far south east corner of the Tremains Farm SFA site. These are shown on Within the North of West Camp SFA site, there is one group of Category B trees (G32 as shown on Drawing NWC:L03 of the document 'Aerospace Business Park, St Athan: Statement in support of the planning application') to the south east of Frogland Farm. All other trees are Category C, the majority within the North of West Camp site being in actual fact trees in hedgerows e.g. group G30 as defined by the tree survey. There are no Category B trees within the Picketston South West SFA site, although Category C trees form boundaries to the fields within this area of the site.
Golf Course	Strips of Cyprus and Acer planting define the routes through the golf course and these are categorised as Category c trees by the tree survey. The only groupings of Category B trees are in the south western corner of the land parcel including a band of scrub and trees surrounding the pill boxes. These Category B trees are G-17 as shown on drawing GC: L04 of the document 'Service Families Accommodation design and Access statement'.

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Table F3 (continued) Main Site: Preliminary Tree Survey Results

Land Parcel	Results
Land parcels applicable to the Northern Access Road route. The road route does additionally pass through the 'DTR outside the wire' land parcel and the 'DTR inside the wire land parcel', the results of which are listed above. The results of the tree survey are shown graphically on the figures listed above within the Aerospace Business Park, St Athan: Statement in support of the planning application' document.	
West Camp Access	Mature blocks of mixed deciduous woodland which line the railway line and the B4265 categorised as Category B and C amenity value.
Land parcels applicable to the Gileston to Oldmill improvements red line boundary	
Gileston	A tree survey completed by Amenity Tree Care of the Gileston land parcel indicates that the majority of trees within this land parcel are within the hedgerows which separate the fields. A group of Category B trees (G2) are located along the southern edge of the B4265. A group of trees (G2) on the steeply sloping valley sides of the River Thaw are categorised as Category A. The northern boundary of the b4265 in this area is bound by hedgerow.
Land parcels within the Waste Water Treatment pipeline route	
Llantwit WWTW route	A tree survey completed by Amenity Tree Care of the Llantwit Treatment Works land parcel indicates that an avenue of trees is a characteristic edge treatment to Water Lane, Wick Road and the railway line. These transport routes are not however completely lined by trees and are coverage is gappy in places. The trees are a combination of Category B and Category C trees. To the north of the B4265, along the route of the pipeline, crosses a landscape consisting predominantly of arable fields delineated by a network of hedgerows. The fields vary in size and shape, with no distinctive pattern. The hedgerow is classified by the tree survey as being Category C.
Land parcels applicable to the Waycock roundabout red line boundary	
Waycock	A tree survey completed by Amenity Tree Care of the Waycock land parcel indicates that a strip of native trees and hedgerow is planted along the eastern and western edges of Waycock Road and the northern edge of Port Road West. Woodland widens to form a triangular shaped woodland block to the far northern section of the red line boundary on the eastern edge of Waycock Road (G5 as shown on the Waycock arboricultural assessment). There are also occasional individual specimen street trees along Pontypridd Road and Port Road. The only Category B trees within the red line boundary of the improvement works, are the triangular shaped woodland block to the east of Waycock Road. Not all trees located within this area are identified by the arboricultural assessment undertaken by Amenity Tree Care. Figures L.451 – L.452 demonstrate the band of trees which mark the northern, eastern and western boundary of the eight properties on the northern side of Port Road West and the band of mature trees which form a field boundary to the east and north east of these properties.

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Tree Preservation Orders

Main Site

Assessment of mapping received from Vale of Glamorgan Tree officer inentified one TPo which related to the Main Site. Tree Preservation Order 1984 relates to two groups of trees at Picketston. Group 2 is located to the south of Picketston Cottages and outside the red line boundary of this proposal. Group 1 is located to the south of Picketston 1&2. This group is located on the eastern edge of the Picketston External Training Area.

Gileston to Oldmill

There are no TPOs located within the Gileston to Oldmill red line boundary.

Waycock Cross

There are no TPOs located within the Waycock Cross red line boundary. A TPO from 1983 on Middleton Plantation to the north west of Waycock cross does not fall within the red line boundary of this proposal.

Built Form

Main Site

Built form is noted here in the context of its contribution to landscape character. (See Chapter 12 Cultural heritage for assessment of potential impacts on listed buildings).

There is a variety of existing built form on the Main Site, including:

- Hangars of varying ages and styles within the airfield section of the site. The largest and most notable is the large white DSG hangar which is located in the northern section of the site between East Camp and West Camp;
- Other MOD offices located in East camp largely one and two storeys in height;
- Two storey accommodation blocks at East Camp;
- The water tower at East Camp which is a visible feature from points within the site;
- A listed church adjacent to Eglwys Brewis Road; and
- Accommodation blocks at West Camp.

Waste Water Pipeline

The route of the waste water treatment pipeline is characterised by occasional scattered farmsteads e.g. Frampton court Farm and Tremains farm, and adjoins the settlements of Llantwit Major in the south and Llanmaes in the north. However, no buildings occur within the alignment of the Waste Water Pipeline.

Gilestone to Old Mill Improvements

No buildings occur within the area of the boundary of the proposed improvement works.

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Waycock Roundabout

No buildings occur within the Waycock roundabout red line boundary.

Conservation Areas (see Figure 7.4)

There are no Conservation Areas directly coinciding with the development proposals and therefore there will be no direct effects. However, there are ten Conservation Areas within the 3 km study area that due to their proximity have the potential to experience indirect effects on character due to changes to their setting arising from the development proposals. These are summarised in Tables F7 to F16, below. There is currently no Conservation Area Statement for Llantwit Major. Where Draft Conservation Area Appraisal and Management Plans are available, they are used in the place of the existing Conservation Area Appraisals.

Table F7 Flemingston (circa. 0.5km north of Golf Course SFA site)

Flemingston Conservation Area Draft Appraisal completed June 2008 by the Directorate of Environmental and Economic Regeneration March 2009	
Location and Setting	It lies on the eastern edge of the Thaw Valley in an elevated position on the ridge line running from north to the south, 5km to the north of St.Athan; The village comprises a number of farm holdings and supporting outbuildings, together with the houses and cottages which have been built around them. Settlement is laid out in a simple grid.
Historical Development and Archaeology	6 County Treasures are identified within the Conservation Area St. Michael the Archangel, designed in the early 14th century; Y Hen Fferm Dy is a farm building in 17th century in origin but remodelled in the 18th and 19th centuries of local rubble, rendered and painted; Flemingston Court is a well preserved early 16th century manor house; Barn and Farmyard Ranges to the south east, the detached kitchen to the north west, as well as the Garden Wall and House Ruins in between are designated as separate County Treasures. Of which, 3 of them are Listed Buildings: Flemington Court Farmhouse, Barns at the Farm and also the telephone kiosk north of Parish Church.
Spatial and Character Analysis	The hamlet is located on a north east facing slope, overlooking the valley of the River Thaw. This provides dramatic views over the landscape to the rising ground and woodlands around the ancient settlement at Treguff. The defining spatial feature of the Flemingston Conservation Area is the network of lanes which converge on the village around St Michael's Church and the almost circular loop which encompasses the former farm buildings to the northeast of Flemingston Court the rural character of the Conservation Area is reinforced by the generously sized building plots (both historic and modern) with their mainly detached buildings. All around Flemingston, and permeating into the centre of the village, are fields enclosed by low hedges, used for grazing animals and for arable farming where the land is flat enough. The profile of buildings set on the ridgeline is enhanced by tall Scot pines set within the gardens

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Table F7 (continued) Flemingston (circa. 0.5km north of Golf Course SFA site)

Flemingston Conservation Area Draft Appraisal completed June 2008 by the Directorate of Environmental and Economic Regeneration March 2009	
Summary of Issues and Management Plan	The maintenance care and enhancement of trees and woodland areas; The protection and restoration of stone boundary walls and hedges which surround the village; The identification and protection of important open areas which determine the character of the village; The enhancement and management of roadside verges within the village; The consideration of development proposals with the benefit of SPG relating to villages in the rural Vale.

Table F8 Llanbethery (circa. 1km north east of Golf Course SFA site)

Llanbethery Draft Appraisal and Management Plan March 2009 by the Directorate of Environmental and Economic regeneration March 2009	
Location and Setting	Lies to the east of the River Thaw on a level plateau stretching between the River and Llancarfan Valley; Linear settlement developed around an ancient chapel of Llancarfan, with few lanes and footpaths running across the grain of the village; Generally residential with little agricultural use remaining.
Historical Development and Archaeology	Linear form of the village prevails with development of new houses within the gardens and small holdings of former farm units; Two building themes dominate – houses built in the early 1970s use stone and render in a contemporary expression; houses in the mid 1980s tend to show a classical composition with traditional windows set in a rendered elevation. No Listed Buildings but have few historically important buildings: The Manse, The Vines, Llanbethery Farm, Courthouse Cottage, Cartref and Ty Mawr.
Spatial and Character Analysis	Stone and render are the dominant building materials; The orientation of buildings on the south of the village street creates a pleasing rhythm.
Summary of Issues and Management Plan	Protection of landscape setting of the conservation area; Respecting the character of the Conservation area where highway improvements are required; Protection of significant views into and out of the conservation area; Maintenance of the historical street pattern; Care and management of important open spaces, trees and grass verges; Protection and repair of stone walls and buildings; Control of new development that might erode the historical character of the conservation area.

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Table F9 Llancadle (circa. 1km east of Castleton External Training Area and Gileston to Oldmill Improvements)

Llancadle Draft Appraisal and Management Plan May 2008 by the Directorate of Environmental and Economic Regeneration

Location and Setting	8km west of Barry on a minor road between Aberthaw and Llancarfan; lies within the rolling coastal plateau of the Vale of Glamorgan;
	Small historic village in a rural setting of open fields and woodland;
	Linear development besides main road through the village and informal settlement pattern beside the lanes to Llancadle Farm; Core of the settlement comprised of about twenty buildings laid out in a close-knit pattern;
	Located on a network of local footpaths and a designated Valeways Walk; Hillside location above the floodplain of the River Kenson;
	Side lanes bounded by stone walls and grass verges leading to an open farmyard;
Historical Development and Archaeology	Iron Age defended enclosures have been recorded in Llancadle Gorse. Evidence of medieval settlement in the immediate area.
	'Llancadl' and 'Lancad' were identified on 1578 map and 1759 map.
	The village underwent little change during first half of 20th century but has substantial infill and extension and alteration of old cottages.
Spatial and Character Analysis	Characterised by low stone walls and unkerbed grass verges detached and semi-detached dwellings and farm buildings set back from the road in single plots; Stone boundary walls as notable feature;
	Negligible public open space and no churchyard or public park; Significant proportion of open space (incidental green spaces) and natural landscape adds to the biodiversity, together with Copse of trees to the south of the settlement and mature trees within the village, especially around Llancadle Farm;
	Contrasting forms of development: linear along the main road, dispersed beside the side lanes to Llancadle Farm;
	Llancadle Farm, a working farm comprising 18th century farmhouse and nearby vernacular stone outbuildings around an open farmyard;
	Llancadle Deserted Village, designated as a Scheduled Monument and a County Treasure, part of which lies within the Conservation Area;
	Extensive rural views to the surrounding countryside, particularly across the Kenson valley, through breaks in the buildings and from the public footpaths;
	Part of the Llancadle Deserted Medieval Village (Scheduled Monument and County Treasure) lies within the Conservation Area;
	No Listed Buildings or Locally Listed buildings;
	Traditionally building materials: locally quarried lias limestone and Welsh slate with timber external joinery.
	Buildings are generally well maintained and in good condition;
Summary of Issues and Management Plan	Protection of landscape setting of the Conservation Area;
	Protection of significant views into and out of the Conservation Area;
	Maintenance of the historical street pattern;
	Care and management of important open spaces, trees and grass verges;
	Protection and repair of stone walls and buildings;
	Control of new development that might erode the historical character of the Conservation Area;

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Table F10 Lancarfan (Circa. 2.5km north east of the Castleton external training area)

Llancarfan Draft Appraisal and Management Plan March 2009 by the Directorate of Environmental and Economic Regeneration

Location and Setting	It is located approximately 3km from the nearest element of the site. It is a nucleated village comprising houses, farm buildings, fields and gardens set within the valley of the Nant Llancarfan.
Historical Development and Archaeology	It is one of the best surviving examples of the Anglo-Norman nucleated settlements of the Vale. The earliest evidence of a settlement is the large Iron Age hillfort located to the east of the village known as Castle Ditches. From the 5th-12th Centuries, this village along with Llantwit Major, became the leading centre of the Celtic Church in SE Wales. In the 1960s, the village started to expand, filling garden plots and setting detached houses along the 2 routes through the village, agricultural buildings were converted to residential use.
Spatial and Character Analysis	The form of the village is nucleated. The character of the village is formed predominantly by buildings, the spaces around which they are grouped and the trees set within gardens on embankments and along the sides of the river. Most houses are contemporary but those predating 1956 still reflect the early form and function of the village. 2 Listed Buildings in the village are the Church of St. Cadoc and the telephone call box outside the Church Hall. Buildings of note include Ty-To Mean, the Green, the Mill, White Chapel, etc. There is a scope for the enhancement of the access and forecourt to the Fox and Hounds, alongside the re-allocation of parking to cater further residential development with improved access to the river.
Summary of Issues and Management Plan	Significant views into and out of the Conservation Area should be protected and enhanced. Alternations/Extension/Repair of old buildings in the village should be complied with the notes set in the Conservation Appraisal. Design of new development in this conservation should respect the context of the wider site, recycle old buildings as a priority, as well as preserve and enhance the character of the Conservation Area but not mimic the architectural styles that would undermine the overall character. Sustainability and scale of buildings should also be taken into account.

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Table F11 East Aberthaw (circa. 1km south east of Gileston to Oldmill improvements)

East Aberthaw Draft Appraisal and Management Plan March 2009 by the Directorate of Environmental and Economic Regeneration	
Location and Setting	5km west of Cardiff International Airport; Dominated by the 19th century terraced houses with long enclosed allotment gardens. The meandering estuary of the river Thaw provided a natural haven for a port, which lead to the development of the village with local and foreign trading;
Historical Development and Archaeology	The early cement works to the east of the village were built in 1888; The Taff Vale Railway Company and the Vale of Glamorgan Railway have built lines through the village. Loss of trade and the connections provided by one of the abovementioned railway. Many of the essential shops have closed and farm buildings have been converted; Very little new development is recorded Transformed from a bustling port to a quiet backwater at present; The Blue Anchor and Marsh House are listed by Cadw Welsh Historic Monuments;
Spatial and Character Analysis	The Blue Anchor, which is of 14th century, dominates the centre of the village, with massive stone walls and heavy thatched roof, while Marsh house, built in the 18th century, is a 2 storey outbuilding projects forward with gable end and external stone steps facing the road; Other important buildings that give the Conservation Area its character include Marsh Cottages, The Mission Room, Aberthaw Farm, The Bethel Baptist Chapel, Lower House and Upper House Farm.
Summary of Issues and Management Plan	Protection of landscape setting of the Conservation Area; Respecting the character of the Conservation Area where highway improvements are required; Protection of significant views into and out of the Conservation Area; Care and management of important open spaces, trees and grass verges; Enhancement of the car park at the centre of the village; Safeguarding the architecture and built form of the buildings that are recognised for the historic context; Control of new development that might erode the historical character of the Conservation Area; Proposals for new development in the Conservation Area should take account of the design principles set out within supplementary guidance prepared for 'Conservation Areas in the Rural Vale'.

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Table F12 Gileston (circa. 0.4 km south west of the proposed Gileston to Oldmill improvements)

Gileston Conservation Area Draft Appraisal completed by the Directorate of Environmental and Economic Regeneration March 2009

Location and Settings	- 1.5km south of St.Athan within the community of St. Athan, overlooking the low lying land behind Limpert Bay and the Bristol Channel.
Historical Development and Archaeology	First farmed and managed by English and Normal settlers and made up of small cluster of farm buildings and cottages forming the core of the village; The major village grouping comprises of substantial barns and agricultural buildings lie to the south of the junction of the three lanes, but have been converted to residential uses.
Spatial & Character Analysis	The defining spatial features of the Gileston Conservation Area are the entrance from the north via the narrow, enclosed lane lined with limestone walls and trees Around Gileston are important landscape features which also contribute to the special character of the Conservation Area. These include the fields between the hamlet and the sea, the 'parkland' field to the south of the Manor House, and the field to the north east of the hamlet, all of which are included within the Conservation Area boundary The rural qualities of the Conservation Area are also reinforced by the many groups of trees, mainly on the northern edges of the hamlet Despite the location close to the power station, only the chimney is immediately visible from the hamlet centre although some noise can be heard.
Summary of Issues and Management Plan	Stone boundary walls, hedges and railings should be retained and protected; Trees: a resurvey of trees within the Conservation Area, including those identified in the TPO is recommended to be carried out; Important open spaces which enfold the centre of the village and contribute to the character of the Conservation Area should be protected and enhanced; New development should not jeopardise the existing character of the Conservation Area in terms of landscape elements of the existing environment.

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Table F13 Boverton (circa. 0.1km south west of proposed 'Tremains Farm' SFA site and northern access road)

Boverton Conservation Area Draft Appraisal completed June 2008 by the Directorate of Environmental and Economic Regeneration	
Location and Setting	Small historic former agricultural village on the coastal plateau beside the River Hodnant; River Hodnant (Boverton Brook) passes to the west of the village, and flows beneath Boverton Road and out of the Conservation Area;
Historical Development and Archaeology	Historic street pattern comprising a network of lanes leading down to a river crossing; Historic linear development alongside Boverton Road; Tranquil atmosphere along Boverton Road east of Boverton House becoming a rural lane at its eastern end; The architectural and historic interest of the area's historic buildings and structures, twelve of which are listed and a further two that are locally listed; Vernacular 16th and 17th century cottages constructed of local limestone.
Spatial and Character Analysis	Primarily residential but includes large modern agricultural buildings; Contains a significant portion of late 20th century detached dwellings; Rural views over surrounding countryside from the south-west of the Conservation Area; Copse of trees in the south-west of the village and mature trees within the village, especially around Boverton Park House and Orchard House; Presence of different green spaces and unmanged floodplains and the River Hodnant adds to the biodiversity of the area; The River Hodnant adds to the local distinctiveness of the area; Northern semi-rural approach to the village along narrow road bounded by high hedges and greenery; Rural setting of the village especially to the south and east where the village abuts open countryside; 12 Listed Buildings and 2 locally listed County Treasures, including the picturesque ruins of Boverton Place, a 16th century mansion deserted in the late 17th century (Scheduled Monument), and Boverton House, a fine rendered and stuccoed house of the late 16th century; The most prevalent historic building material is local lias limestone – some have been painted or rendered, and slate roofs are common; Welsh slate is prevalent, as well as red clay tiles. Stone boundary walls are also distinctive feature of the area; General condition of the Conservation Area is good.
Summary of Issues and Management Plan	Protection of landscape setting of the Conservation Area; Protection of significant views into and out of the Conservation Area; Maintenance of the historical street pattern; Care and management of important open spaces, trees and grass verges; Protection and repair of stone walls and buildings; - Control of new development that might erode the historical character of the Conservation Area.

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Table F14 Lanmaes (circa 0.3km north west of proposed 'Tremains Farm' and 'north of west camp' SFA sites)

Llanmaes Draft Appraisal and Management Plan June 2008 by the directorate of Environmental and Economic regeneration	
Location and Setting	Small village in a rural setting of open fields located to the north-east of Llantwit Major, about 30km south west of Cardiff; Historic settlement pattern of mansion, church, cottages and farm buildings arranged informally around intersecting curved and kinked narrow lanes of varying width; A stream flows through the village green. Located on a network of local footpaths and the Valeways Millennium Heritage Trail;
Historical Development and Archaeology	The architectural and historic interest of the area's historic buildings and structures, 10 of which are listed and a further 7 which are County Treasures; Two distinct and separate groups of historic development: Gadlys (north) and Llanmaes (south), now conjoined by late 20th century residential development; Remains of Malefant Castle and, just outside the Conservation Area, Bedford Castle, a collapsed 15th century structure in a field to the south, now a scheduled monument; Llanmaes House, a grade II* listed building and one of the best architectural and highly finished houses in the Vale; Outstanding ensemble of Llanmaes House, St. Cattwg's Church and vernacular cottages.
Spatial and Character Analysis	The area is primarily residential, with narrow lanes and modern infill of detached houses; Lanes bounded by stone walls and grass verges; Presence of the village green and smaller green around the village pump; Mature trees contribute to the rural atmosphere of the village; Small historic items which add to the area's interest e.g. old pump, anvil, stone gate piers, iron gates; The most prevalent historic building material is local lias limestone – some have been painted or rendered, and slate roofs are common. Important view of Llanmaes from the southern approach road; rural views to the surrounding countryside through breaks in the buildings and from the public footpaths; General condition of the area is generally neat and well cared for. Buildings appear to be in good condition and well maintained.
Summary of Issues and Management Plan	Protection of landscape setting of the Conservation Area; Protection of significant views into and out of the Conservation Area; Maintenance of the historical street pattern; Care and management of important open spaces, trees and grass verges; Protection and repair of stone walls and buildings.

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Table F15 Llanminhangel (circa. 2.5km north west of the Picketston external training area)

Llanmihangle Draft Appraisal and Management Plan September 2008 by the Directorate of Environmental and Economic Regeneration	
Location and Settings	Llanmihangel is recorded as being a grange in 1166. The earliest records for the important building, the Church of St.Michael and All Saints, in this Conservation Area date from 1252 and 1254.
Historical Development and Archaeology	Llanmihangel is recorded as being a grange in 1166. The earliest records for the important building, the Church of St.Michael and All Saints, in this Conservation Area date from 1252 and 1254. The earliest house, of which a stone vaulted undercroft remains, was recorded in the 14th century. The Conservation Area, as a whole, underwent little change between 16th to 19th centuries, but restoration of both church and house had been taken place in the 2nd half of 19th century. The medieval barn has been converted to residential use. Fishponds and water engineering along Nant Llanmihangel have become overgrown.
Spatial and Character Analysis	The Conservation Area embraces a historic group of buildings set within a secluded valley. Its core is a virtually complete medieval site consisting of an impressive gentry house - Plas Llanmihangel, its 'Gardens of Pleasure', the Church of St.Michael, Rectory Farm, converted barn and stables, fishponds and corn mill. Long views across and along the valley of Nant Llanmihangel are possible in the outer limits of the area, whereas the core of the hamlet has a much more enclosed feel as it lies nestled close to the valley bottom and is partly surrounded by woods and trees. The private grounds of Plas Llanmihangel have helped forming the spatial character of the Conservation Area, for which the origin neat formality character of the site has been changed into a much more wild and untamed space dominated by evergreen yews. Local lias limestone is the prevalent building material under Welsh roofs. Other important local details that contribute to the local distinctiveness of the area include traditional hedgerows which line the roads and form field boundaries, as well as grass verges to the roadside. Extensive and varied green spaces have provided natural habitats for wildlife and help to promote biodiversity.
Summary of Issues and Management Plan	Protection of significant views into and out of the Conservation Area. Maintenance and enhancement of the historical landscape which frames the building group. Building maintenance and repair, especially to Plas Llanmihangel and the Church. Care and management of vegetation, stone boundary walls, hedgerows, historic engineered waterworks. Drainage and management of wetland areas. Restoration and repair of some of the local treasures such as St. Anne's Well.

Landscape Character

Landscape Pattern and Scale

Main Site

There are eight contrasting scales of development within the development site which largely relate to current land use. These are:

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1) The central section of the site which contains the very large (in terms of height and mass) DSG Superhangar, other hangars and the open and expansive runway. Views out to the surrounding landscape are also possible, contributing to the large and expansive landscape scale. There is no notable pattern to this area of the landscape and the landscape pattern is not a distinctive element of the landscape character;

2) At East Camp the buildings are set on a grid road pattern. The grid pattern is strengthened by tree planting which forms avenues. The buildings are characteristically two storeys high and even larger features such as the water tower are dwarfed by the larger scale hangars to the west. There is no notable pattern to this area of the landscape and the landscape pattern is not a distinctive element of the landscape character;

3) Arable fields in the northern (adjacent to Picketston) section of the site are medium sized and bound by hedgerow. The arable fields are located to the west and south west of hangers on MoD St. Athan. To the south these fields are separated from Eglwys Brewis Road by Nant y Stepsau. Vegetation along the stream partially encloses views out from the area, as do the hedgerow within the area. However, views of large scale features to the south and east e.g. hangars to the east and to the south including partial views of the large scale hangars of 'Twin Peaks' and the DSG hangar, detract from the medium scale, and rural character of these fields.

4) Similarly to the arable fields at Picketston, arable fields at *Batslays* are medium sized and bound by hedgerow, creating a localised area of medium scaled landscape with a rural character. However, again similarly to fields west of Picketston, views of large scale features such as hangars on MoD St.Athan and the B4265, detract from the medium scale and rural character.

5) At its most easterly point the pipeline route crosses the landscape from the existing MoD St.Athan base, past Froglands Farm, and past the southern edge of Llanmaes. The strip of land between Llanmaes and the B4265 is undulating, including shallow valley sides of Llanmaes Brook and Boverton Brook. Pastoral fields and paddocks are the dominant land use, characteristically being bound by hedgerow and post and wire fencing. To the south of Llanmaes, the fields are characteristically small in scale. The vegetated course of Llanmaes Brook further contributes to the small scale, enclosed pattern and scale.

Views are generally enclosed and short range as a result of the land form, and this contributes to the small scale of the landscape. Where views out from the pastoral landscape are possible, they are to the village of Llanmaes, and also to larger scale features such as the B4265, the edge of Llantwit Major and partial views of large scale military features such as the DSG Hangar, does detract from the small scale, rural character.

6) Further to the west of Llanmaes, along the rote of the WwT pipeline there are some large scale fields and some of the fields are arable. The larger scale fields dilute the small scale, domestic character found to the south of Llanmaes.

7) The landform surrounding the B4265 between St.Athan and the River Thaw is dominated by medium-large scale arable fields surrounded by close-trimmed hedges. Landform drops into the River Thaw Valley sides. The valley sides are wooded, and this creates a sense of separation from the surrounding arable landscape.

Although the landscape surrounding the B4265 is largely rural in character, glimpsed views of settlement at St.Athan and large scale military/industrial features such as Aberthaw Power station and the DSG hangar at MoD St.Athan are occasionally visible on the horizons when

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passing through the landscape, and this detracts from the intimate scale and character which is created by the enclosed wooded river valley and enclosed, hedgerow lined fields.

8) The landscape surrounding Waycock Roundabout is characterised by pastoral fields bound by mature hedgerow and belts of trees. In places the hedgerow trees widen out into recently planted narrow woodland blocks. Woodland blocks are a characteristic feature of the wider landscape outside of the study area, but also extend into the study area e.g. Middleton Wood. The woodland and mature hedgerows create a sense of enclosure and small scale to the north of the study area. To the south and east, within the residential area of Barry, the sense of enclosure is heightened as views are obstructed by the surrounding built form. The combination of housing and fenced off gardens creates a consistently small scale character, contrasting with the wider rural landscape to the north of the study area.

The overall landscape pattern is uncomplicated, consisting of either small scale pastoral farmland and woodland, or small scale residential development.

Countryside Council for Wales *LANDMAP* Assessment

A landscape character assessment of the landscape has been undertaken by the Countryside Council for Wales (www.Landmap.ccw.gov.uk). *LANDMAP* is the national information system for taking landscape into account in decision-making. *LANDMAP* separates the landscape into five 'aspects' as follows:

- **Visual & Sensory**: identifies those landscape qualities that are perceived through the senses. It deals with the individual physical attributes of landform and land cover, as well as their visual patterns of distribution and sensory characteristics, and the relationships between them in a particular area. (Refer Table F16, below).
- **Cultural Landscape**: considers the relationship that exists between people and places; how people have given meaning to places, how the landscape has shaped their actions and their actions have shaped the landscape. (Refer Table F17, below).
- **Historic Landscape**: focuses on how archaeological and historical sites relate to each other and to the surrounding landscape. (Refer Table F18, below).
- **Geological Landscape**: the geology, geomorphology and hydrology of the area. (Refer Table F19, below).
- **Landscape Habitats**: the distribution of vegetation and habitats and the basis for landscape ecology. (Refer Table F20, below).

Tables F16 to F20 provide a description of each of the five Aspect Areas that are relevant to the Landscape Assessment Baseline and the LANDMAP assessment evaluation of those areas in each case. This is in line with guidance set out in LANDMAP Information Guidance Note 3 produced by CCW which states that all five aspect areas should be used to inform the baseline. The Tables should be read in conjunction with **Figures 7.5- 7.15**, which define the Aspect Area boundaries and show the overall evaluation judgement assigned by the LANDMAP Assessment (with the exception of the historic aspect areas which currently has no evaluation judgement within the LANDMAP assessment).

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The baseline presence of landscape features, within both the main red line boundary area and the Waycock roundabout area are summarised in section 1.4 as there is potential for the landscape elements to experience direct effects within the red line boundaries. There is no potential however for landscape elements to experience direct effects as a result of the proposed development, outside of the red line boundary. There is potential for the proposed development to have indirect effects on the landscape character of the aspect Areas defined by LANDMAP and also upon Landscape Designations. For this reason, the LANDMAP aspect areas and landscape designations which fall within the two study areas are detailed in this section.

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Table F16 Visual and Sensory Areas

Aspect Area	Location	LANDMAP Assessment
Visual and Sensory		
1. RAF St Athan (VLFGLVS456)	Covers the main DTC site and majority of the ABP site.	**Low** - the aspect area presents no picturesque scenic views but rather a number of elements in apparently discordant composition. The areas integrity has been eroded by large scale development.
2. Heritage Coast Hinterland (VLFGLVS890)	Covers the most southerly section of the ABP site and the southern access junction	**Outstanding -** The combination of vernacular buildings and settlements, well maintained walls and hedgerows, wind sculpted trees and woodland in secluded incised valleys results in pleasing patterns, often against a backcloth of the Bristol Channel
3. Lias Plateau (VLFGLVS805)	Covers the area to the north and north west of the existing MoD base, including the location of the proposed northern access road, Tremains Farm SFA, Picketston SFA and Castleton external training area	**Moderate** - There are long views to the coast in places and to the hills over the pleasant landscape. The stone and render settlements are generally attractive and complement the surrounding landscape.
4. Thaw Power Station (VLFGLVS998)	Located adjacent to the west of the Gileston to Old Mill Road improvement	**Low** - the overall sense of the power station is a large detractor in the landscape despite its distinctiveness and positive management.
5. Llantwit Major (VLFGLVS235)	Located adjacent to the south of the proposed northern access road at the point it adjoins the B4265 and Tremains Farm housing SFA	**Moderate -** Core is well maintained with stone buildings set in medieval street pattern offering picturesque views. Outer housing areas spoil intrinsic pattern of settlement and provide minor detractor to wider landscape in parts. The core is well maintained and is of consistent and distinctive character. This is not reflected in the outer areas and newer commercial premises.
6. Lower Thaw Valley Sides (VLFGLVS110)	Located immediately to the east of the DTC area.	**High** - The aspect area offers accessibly viewed attractive views of fields, hedgerows, and wooded areas on valley sides and ridge-tops in pleasing compositions.
7. Llancarfan and Waycock Valleys (VLFGLVS453)	Located approximately 2km to the east of the Defence Technical College at East Camp.	**High -** The aspect area possesses a high quality scenic landscape with many picturesque views to fields, hedgerows and steeply wooded valley sides in an aesthetic composition.

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Table F16 (continued) Visual and Sensory Areas

Aspect Area	Location	LANDMAP Assessment
8. Central Vale Ridges and Slopes (VLFGLVS146)	Located approximately 2km to the north of the Defence Technical College at Picketston.	**Moderate** - The aspect area offers many views to hedgerows, fields, and treed areas in harmonious composition. However the flat nature of the aspect area's landscape (level plateau) makes for a less pleasing composition of elements than the more undulating or hilly areas.
9. Heritage Coastal Strip (VLFGLVS950)	Located approximately 1km from the west of the Aerospace Business Park South.	**Outstanding** - The area presents many views of outstanding quality to sheer cliffs of clear rock formation and patterns, neighbouring undeveloped beaches plus sea.
10. Glamorgan Heritage Coast Intertidal (VLFGLVS920)	Located approximately 1km from the west of the Aerospace Business Park South.	**Outstanding** - There are superb views along coast and out to sea with high scenic quality of sand and wavecut platforms.
11. Aberthaw Estuary (VLFGLVS569	Approx 2km south east of the proposed Gileston junction enhancements	**Low** - Degraded landscape that is a detractor.
12. Aberthaw Quarry (VLFGLVS742)	Approx 1.5km east of the proposed Gileston junction enhancements	**Low -** The quarry and works are a major detractor.
13. Lower Thaw Valley Floor (VLFGLVS305)	Approx 0.8km north of proposed Castelton external training area	**Medium** - The aspect area offers views to a distinctive flat landscape of pasture, drainage channels and marshy areas but this is spoilt to an extent by the power lines/pylons. It has a consistent character but elements such as hedgerows are gappy and overgrown in places.
14. Llandow Industrial Estate (VLFGLVS467)	Located approximately 1.5km to the north of the western end of the proposed rising main road.	**Low** - Although the aspect area offers some interesting views to WII hangars and runways the area is generally marred by commercial development and associated clutter which is unsightly. The integrity of the area has been severely affected, by industrial and commercial development, by poorly maintained landscape areas and by rubbish dumping.

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Table F16 (continued) Visual and Sensory Areas

Aspect Area	Location	LANDMAP Assessment
15. Nant Tre Gof Valley (VLFGLVS952)	Approx 2.5km to the north west.	**Moderate** - The aspect area offers many attractive views including historical settlements and buildings set in pastoral landscapes and woodlands.
16. Cardiff Wales Airport (VLFGLVS723)	Located approximately 2.5km to the east of the Gileston road improvement.	**Low** - The aspect area offers few views of a pleasing picturesque quality, but rather views to an open and flat landscape dominated by fences and the huge airport terminal.
17. Upper Waycock Valley/Dyffryn Area (VLFGLVS608)	Coincides with the Waycock roundabout improvement area.	**High** - The LANDMAP assessment notes that the aspect area has broad, pleasing views to well managed countryside with a coherent field pattern and woodlands with settlements well integrated with the landscape and surrounding vegetation. The settlements have stone walls and streams also add to the picturesque quality of this area. The area is unspoilt, well managed and is in good and consistent condition throughout. However, the roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.
18. Rhoose Hinterland (VLFGLVS641)	Coincides with the Waycock roundabout improvement area.	**High** - This area is attributed a high overall evaluation in the LANDMAP assessment. However, the roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.
Barry (VLFGLVS219)	Coincides with the Waycock roundabout improvement area.	**Low** - This area is attributed a low overall evaluation in the Landmap Assessment and for the purposes of this assessment has a low sensitivity. The roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.
Llancarfan and Waycock Valleys (VLFGLVS453)	Coincides with the Waycock roundabout improvement area.	**High** - This area is attributed a high overall evaluation in the LANDMAP Assessment. However, the roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.

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Table F17 Cultural Landscape Aspect Areas

Aspect Area	Location	LANDMAP Assessment
Cultural Landscapes		
1. Fonmon Castle (VLFGLCL040)	Approximately 1km to the east of the nearest element of the scheme (Field training area).	**Moderate** - The area has an overall 'moderate' value judgment. The write up states that this is not to disparage its historical importance, but to value its cultural essence as a part time leisure destination.
2. Llancarfan (VLFGLCL021)	Approximately 1km to the east of the nearest element of the scheme (Field training area).	**Outstanding** - Llancarfan village stands within a Registered landscape of Outstanding Historical Interest and aesthetic quality and contains a designated Conservation Area. The registered landscape represents 'one of the best surviving and most complete typical parts of the Vale of Glamorgan.
3. West Aberthaw power Station, cement Works (VLFGLCL003)	Approximately 1km to the south east of the nearest element of the scheme (field training area)	**Outstanding** - It is judged by Landmap to be of 'outstanding' value due to the prominent industrial structures located within an otherwise rural and coastal landscape.
4. Llantwit Major (VLFGLCL005)	Immediately to the south west of the proposed rising main corridor.	**High** -The Landmap data states that 'the essence of the place has been compromised by the permitting of inappropriate and unattractive development'. However, the value of the area is judged to be high as the village possesses a reasonably well preserved historic core and the village has strong associations with Early Christianity.
5. Heritage Coast (VLFGLCL002)	Immediately adjacent to the south of the site.	**High** - The Heritage coast has been designated by the local authority. It stretches for 14 miles from St. Athan westwards to the Ogmore River and sits adjacent to the south of the site. The landscape comprises extensive cliff lands of varying height, moorland and dips and hollows of greenery.
6. RAF Station St. Athan (VLFGLCL004)	The majority of the site falls within this aspect area.	**Outstanding** - The LANDMAP data states that 'the RAF station is uniquely self contained with a specific cultural character markedly different from that of the surrounding landscape'.
7. Llandow Industrial estate (VLFGLCL026)	Approximately 1km north west of the proposed rising main corridor.	**Outstanding** -The Landmap information states that the area has 'moderate' value and that 'at present it would appear that the developments are principally of local vale to residents of the Vale'.
8. Llandow Car Racing Circuit (VLFGLCL027)	Approximately 1.5km to the north of the proposed rising main corridor.	**High** -The circuit occupies part of a WWII redundant airfield and has been used to host car and motorcycle racing events regularly since early 1970s. The facility is alien to the essentially agricultural nature of the surrounding landscape.

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Table F17 (continued) Cultural Landscape Aspect Areas

Aspect Area	Location	LANDMAP Assessment
9. Vale of Glamorgan Rural Landscape (VLFGLCL039)	The proposed rising main corridor, Field Training Centre and part of Defence Technical College at Picketston fall within the aspect area. The area also coincides with the Waycock roundabout improvement area.	**High** - The Landmap information states that 'Vale of Glamorgan is essentially an evolved agricultural landscape with the evidence of its historic past and the unspoiled nature of the landscape is evidenced by the designations and 16 registered parks and gardens, as well as the high number of Conservation Areas'. None of these coincide with landtake for the proposed development.
10. St. Donats and Atlantic College (VLFGLCL006)	Immediately to the south of the B4265 and the proposed junction with the northern access road.	**Outstanding** - The Landmap information states that 'St Donat's Castle has evolved into both a world known educational establishment and a locally important centre for the arts, and that Atlantic College is the only United World College in the UK'
11. Vale of Glamorgan Railway (VLFGLCL009)	This aspect area runs along the southern margin of the site and across one section of the proposed main rising corridor.	**High** - as an example of determinedly successful local authority planning policies
12. Rural Village Conservation Areas (VLFGLCL028)	5 out of the identified 26 Rural Village Conservation Areas are located within the 1km radius boundary of the site	**Outstanding** - as a group of historically and socially important settlements.
13. Rhoose & Fontygary Leisure Park (VLFGLCL038)	This aspect area is approximately 2km from the south-eastern section of the site and separated into 2 halves by the railway line.	**High** - as planned housing and leisure developments meeting contemporary social needs.
14. Cardiff International Airport (VLFGLCL010)	The airport is located approximately 2.5km south-east of the site, and its boundary is drawn around the mapped area of the Airport itself.	**High** - as an example of a regional airport with aspirations to become more truly "international"
15. Barry (VLFGLCL012)	The area coincides with the Waycock roundabout improvement area.	**High** - This area is attributed a high overall evaluation in the LANDMAP Assessment due to 'evident determination to create a strong future through regeneration' [3]

[3] Vale of Glamorgan Landmap data, Countryside Council for Wales, (http://landmap.ccw.gov.uk) Barry Aspect area VLFGLCL012,

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There are 15 historic landscape aspect areas within the 3km study area. A summary of the key features of each, particularly the landscape features which relate to the present day landscape, are summarised below. No evaluations are given for the historic landscape aspect areas. For this reason, a statement of sensitivity is not given as part of this landscape appendix. Instead the key historic features are noted and used in the cultural heritage assessment (chapter 6)

Table F18 Historic Landscape Aspect Areas

Aspect Area	Location	Summary Information*
Historic Landscape		
1. Vale of Glamorgan coast littoral (VLFGLHL001)	Approximately 1km to the south of the nearest element of the scheme.	This aspect area stretches from Cardiff Bay in the east to the flats of Trwyn y March to the west and includes part of the Glamorgan Heritage Coast with numerous casual finds of archaeological material from all periods.
2. South Vale Communication Corridor (VLFGLHL002)	Approximately 3km to the south of the nearest element of the scheme.	This aspect area consists of historic settlements of Llantwit Major, Wick, St. Brides Major and the Cardiff International Airport. It has been used as a communication route from Roman times connecting numerous villas.
3. Aberthaw Industrial (VLFGLHL028)	Approximately 1km to the south east of the nearest element of the scheme, at the mouth of the River Thaw.	It is an industrial area with the following dominant industrial features: Aberthaw Power Station, Aberthaw Cement Works and a limestone quarry. The power station currently generates renewable energy by biomass materials.
4. Porthkerry Rural (VLFGLHL030)	Approximately 1km south east of the proposed Castleton external training area. Includes the south western edge of the Waycock Roundabout improvement area.	Porthkerry Rural is the remains of a once extensive agricultural landscape of large regular fields. It has suffered urban inundation and expansion by the industries at Aberthaw, the modern settlements of Rhoose and Cardiff International Airport. Important historic landscapes include Porthkerry Bulwarks (Iron Age multivallate hillfort), Church and Cwn-Cidy Farms at Aberthaw East and Fonmon (Roman settlements).
5. RAF St. Athan (VLFGLHL031)	Falls within the site boundary and forms the heart of the site.	It includes the historic villages of St. Athan and Eglwys Brewis and a modern RAF base, as well as WWII airfields. The earliest activity at St. Athan are two Bronze Age amber beads, other historic findings include a Roman hoard of coins and Medieval remains which include an abandoned linear settlement on the outskirts of St. Athan.
6. Llancarfan (VLFGLHL032)	Approximately 0.3km east of the proposed Castleton Training area. Covers the western section of the Waycock roundabout improvement area and extends as far south as St Athan.	It is considered to be one of the best surviving examples of the historic landscapes in the Vale, with the presence of the ancient church within its nucleated village and the diverse evidence of land use from the prehistoric period onwards including an Iron Age hillfort, Early Christian monastic site and Llancarfan village itself.

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Table F18 (continued) Historic Landscape Aspect Areas

Aspect Area	Location	Summary Information*
7. RAF Llandow (VLFGLHL033)	Approximately 1.5km to the northwest of the proposed northern access road.	The aspect area boundary was created during the WWII when a base was established for the RAF, and the boundary follows the extent of the airfield. Prior to this founding, the area has many Bronze Age burial mounds.
8. St. Donats, Monknash and St. Brides Majo (VLFGLHL036)	Immediately to the south of the ABP site and the proposed B4265 southern access road junction improvements.	It consists of large regular shaped fields intersected by numerous steep sided valleys open to the sea. It has a high density of prehistoric remains, including wide distribution of Bronze Age round burrows across the area and burials remains and promontory forts of Iron Age along the entire coastline.
9. Fonmon Castle (VLFGLHL038)	Approximately 1.5km to the east of the Castleton external training area.	The Castle is a substantial castellated mansion with rendering and Georgian sash windows, dating from the medieval and post-medieval periods. It has been under constant expansion since 12th Century by three families, the St.Johns, the Joneses and the Boothbays, who are the occupants of the Castle.
10. Old Beaupre (VLFGLHL040)	Approximately 1.5km to the north of the nearest element of the site.	This ruined manor house is one of the more important 16th Century houses in the Vale situated on level ground on the eastern edge of the Thaw River Valley. The manor consists of a number of ranges, built in local lias limestone, around three courtyards. It is also designated as a Registered Historical Park and Garden.
11. Thaw River Valley (VLFGLHL049)	Approximately 1km to the north east of the proposed sewage treatment alignment.	It is the largest river valley in the Vale and has dictated the pre-Norman administrative boundaries of Gorfynydd and Penychen, whereas the dominant historic landscape form is medieval, small regular fields are located on the valley sides around the older settlements Llanhough, St. Mary's, Flemington and Castleton.
12. Llandow Rural (VLFGLHL051)	Approximately 2.5km to the north of the nearest element of the site.	A large tract of agricultural land, comprising large irregular shaped fields, most likely enclosed during the post-medieval period. The aspect area is centred on the medieval village of Llandow, with its 13th century church to the holy Trinity and several 14th century hall houses flanking the main street.
13. Llamihangel Place (VLFGLHL041)	Approximately 1.5km to the north west of the nearest element of the site.	Llanmihangel Place is a Tudor mansion built in the small valley of the Nant Llanmihangel. The house, formal garden and orchard of the 16th and 17th centuries have survived intact and largely unaltered. It is complete with terraces, steps and yew-lined walks. And it is designated as a Registered Historic Parks and Gardens.
14. Llysworney and Llandough (VLFGLHL052	Adjacent to the north of the existing RAF base. The northern access road and Picketston SFA site fall within the boundary of this aspect area.	A large rural landscape of relict medieval fields, many small regular fields (strip) shown on Ordnance Survey first edition map (1878) but now with many boundaries removed creating larger fields but generally keeping historic character. Strip fields tend to cluster around the medieval settlements at Llysworney, Llandough, Colwinston, Llanmaes, St Mary"s Church and Castleton. Bronze Age round barrows are broadly distributed across the aspect area, a significant number are well-preserved and as such are protected.

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Table F18 (continued) Historic Landscape Aspect Areas

Aspect Area	Location	Summary Information*
15. Rhoose (VLFGLHL029)	Approximately 2.5km to the south east of the Castleton external training area.	Rhoose is a nucleated medieval settlement with later ribbon development along Porthkerry Road, west of Cardiff Airport. It was originally a small hamlet centred on a fortified manor house. The ribbon development along Porthkerry Road is first shown on the fourth edition Ordnance Survey map (1947) and suburban housing estates were added in the latter part of the 20th century.
16. Dyffryn	Covers the northern side of Port Road West to the north eastern edge of the study area.	
17. Barry (VLFGLHL004)	Covers the southern section of the site, from Port Road and Port road west, southwards.	

* **No evaluation judgements are made as part of the Historic LANDMAP Assessment**

There are eight geological landscape aspect areas within the 3km study area. The geology of each area has an impact upon the landform, type of vegetation and overall character. As part of this baseline assessment, the key landscape manifestations of the geology are summarised and the evaluation judgment ascribed by the LANDMAP assessment is used as sensitivity judgement in this appendix to assess the overall effects of any changes to the geological features and manifestations, as a result of the proposed development.

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Table F19 Geological Landscape Aspect Areas

Aspect Area	Location	LANDMAP Assessment
1. Moulton (VLFGLGL170)	Approximately 2.5km to the east of the Field Training Area at Castleton.	**Moderate** - This aspect area consists of segment of broad Blue Lias' plateau (Lower Jurassic) including well developed internal scarps where softer Lavernock Shales between limestone-shale St Mary's Well Bay and Portkerry members have been eroded back to form steep slope above platform of former and below plateau of latter member. Steep sided cwms also typical. No SSSI/GCR, geological SINC, 2nd tier or RIGS sites are found.
2. Ogmore-Nash-Breaksea (VLFGLGL221)	Approximately 1km to the south of the Aerospace Business Park South.	**Outstanding** - This aspect area corresponds to the cliffs and dominantly rocky foreshore between Ogmore-by-sea and Breaksea Point on the west side of the Thaw Estuary. Most characteristic are the vertical cliffs of alternating limestone and shales of the Portkerry Member of the Lower Lias Formation, which include the spectacular Nash Point. Lower cliffs near Ogmore-by-sea include famous exposures of marginal Triassic and Jurassic deposits unconformably overlying Carboniferous limestone. Cliffs are cut by deep cwms. Monknash Coast SSSI and Southerndown Coast SSSI fall within its boundary.
3. St. Hilary (VLFGLGL282)	Approximately 3km to the south east of the Gileston Road improvement.	**High** - This aspect area corresponds to the cliffs and dominantly rocky foreshore between Ffontgari Bay and Barry, to the east of the Thaw estuary. Most characteristic are the vertical cliffs of alternating limestone and shales of the Porthkerry Member of the Lower Lias Formation (Lower Jurassic), which locally have been breached by inland quarries in similar materials. No SSSI/GCR, geological SINC, 2nd tier or RIGS sites are found.
4. Ewenny-Penllyn (VLFGLGL492)	Approximately 2km to the north of the Defence Technical College at Pickleston.	**Outstanding** - Continuation of low, broad ridge of Carboniferous limestone with flanking deposits of marginal facies Triassic and Jurassic. Dry valleys present. Ewenny and Pant Quarries SSSI (part - for latest Triassic (Rhaetian) mammals in fissures) and Potential RIGS/SINC sites include key sections in Carboniferous limestone in Rhuthin area and lead mines/deposits near Colwinston and Llangan are present in this aspect area
5. Thaw-Waycock (VLFGLGL514)	Approximately 3km to the south east of the Gileston Road improvement.	**Moderate** - Dendritic river-flood plain system in typically steep sided narrow valley, with local small alluvial fans where tributaries enter. Estuary of main Thaw River is distinctly fan shaped but significantly modified by industrial activity, including a power station, associated ash dumps and aggregate extraction.
6. Coed Hills (VLFGLGL614)	Approximately 1.5km to the proposed housing area at the residential area between Flemingston and Eglwys Brewis.	**Moderate** - Small segment of dissected 'Blue Lias' plateau with distinctive tabular hills with scarp face in Lavernock Shales Member, capped by Portkerry Member limestone-shales, on a platform of St. Mary's Well Bay Member.

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Table F19 (continued) Geological Landscape Aspect Areas

Aspect Area	Location	LANDMAP Assessment
7. Llanwit-St. Athan (VLFGLGL863)	The majority part of site falls within the boundary of this aspect area. Dominantly rural area including heritage coast.	**Moderate** - Broad, low, dissected coastal plateau underlain by Lias (Lower Jurassic) with steep sided valleys and short steep cwms cut into cliffs adjacent to the coast. Level plateau includes two airfields. Some periglacial deposits (head) in some valleys and cwms. Part of Monknash Coast SSSI with Pleistocene-Holocene features falls within the area, but no geological SINC, 2nd tier or RIGS sites are found.
8.Llanbethery(VLFGLGL953)	Located adjacent and immediately to the east of the Defence Technical College. Dominantly rural area without significant development.	**Moderate** - Segment of dissected 'Blue Lias' plateau, including internal scarps where softer Lavernock Shales Member has been eroded to steep slope below plateau of limestone-shale Portkerry member and above platform of St.Mary's Well Bay Member. Steep sided cwms also present.
9. Barry-Rhoose (VLFGLGL962)	A single geological aspect area covers both the Waycock roundabout and the surrounding 1km study area	**High** - This aspect area covers the entire red line boundary and has an overall high evaluation as a result of the presence of key inland exposures of Lower Jurassic Blue Lias Formation in active and disused quarries (e.g. near east Aberthaw and Font-y-gary) , with scientific and educational potential

There are 14 landscape habitat areas covering the 3km study area. Information about the landscape features which result from the habitats in each area are summarised below. The overall evaluation criteria judged by LANDMAP are used as the sensitivity judgements against which to assess overall effect later in this cappendix.

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Table F20 Landscape Habitat Aspect Areas

Aspect Area	Location	LANDMAP Assessment
Heritage Coast (VLFGLLH325)	Approximately 1km to the south of the Aerospace Business Park South.	**Outstanding** - Intertidal habitats largely characterised by limestone cliffs, wave cut platforms and cobbles beaches.
Lower Thaw Valley (VLFGLLH350)	Small parts of both the Gileston Road improvement and the Defence Technical College fall within this aspect area.	**High** - This aspect area is a grazing marsh with tidal influence supporting typical salt marsh plant species and located in a sheltered section of the lower Thaw Valley
Cowbridge South – Thaw Valley (VLFGLLH436)	Approximately 2km to the north of the Defence Technical College at Picketston.	**High** - Narrow valley contained by steep slopes supporting semi-natural broadleaved woodland (ash dominated). Grasslands of the floodplain are generally improved. The Watercourse and occasional ox-bow lakes and ponds are focus of biodiversity interest.
Cowbridge West (VLFGLLH435)	Approximately 1.5km to the north of the Defence Technical College at Picketston.	**Moderate** - Intensively managed agricultural landscape west of Cowbridge consisting of large, improved grassland and scattered arable fields with intensively managed field boundaries.
Coastal Grasslands & Cwms (VLFGLLH523)	Approximately 1.5km to the south west of the western end of the proposed rising main corridor.	**Outstanding -** Exposed limestone sea cliffs and coastal grasslands of the cliff edge. Flushes provide habitats for a variety of notable plants and animals. Scrub woodland is associated with cwms/dissected river valleys perpendicular to the coastline and thus providing shelters for birds and mammals. The high proportion of habitats protected by site designations forms an interconnected mosaic of valuable habitats along the Vale coastline.
Ogmore-Llantwit Arable Belt (VLFGLLH582)	The proposed rising main corridor and Eglwys Brewis Road Corridor, as well as part of the Field Training Area at Castleton and ABP south fall within this aspect area.	**Moderate** - Intensive agricultural management supporting large fields of improved grassland and arable crops. Field boundaries, occasional ponds and minor watercourses largely provide the focus of biodiversity interest.
St Athan (VLFGLLH583)	A major part of the site.	**Low** - Area largely modified by urbanisation. Biodiversity interest associates with amenity grasslands (gardens). Grasslands bordering the runways have possibly developed a relatively interesting neutral grassland community. Overall, it is a built-up area with limited value for wildlife.
Llantwit Major (VLFGLLH614)	Immediately adjacent to the south of the proposed rising main corridor.	**Low** - Built-up area associated with Llantwit Major but the open areas of grassland and garden provide the focus for biodiversity interest.
Aberthaw River Valleys (VLFGLLH786)	Part of the Defence Technical College at Castleton falls within the aspect area.	**High** - A mosaic of habitats centred on dissected river valleys that harbour floodplain grasslands of poorly drained character and steep valley slopes supporting semi-natural broadleaved woodland and occasional species-rich semi-improved neutral grasslands.

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Table F20 (continued) Landscape Habitat Aspect Areas

Aspect Area	Location	LANDMAP Assessment
Aberthaw (VLFGLLH839)	St Athan Road junction improvement and Gileston Old Mill Road improvement works sites fall into this aspect area.	**Moderate** - Improved agricultural landscape is dominant and the underlying influences of limestone and proximity to the coast provide the conditions for fragments of notable grassland in relatively undisturbed areas such as road verges.
Rhoose-Moulton (VLFGLLH840)	Approximately 2.5km from the east of the Defence Technical College at Castleton. Coincides with the Waycock roundabout improvement area.	**Moderate** - A landscape of undulating topography largely dominated by agriculturally improved ground. Field boundaries, minor watercourses and occasional semi-improved grasslands form focus of biodiversity interest.
Boverton (VLFGLLH897)	Immediately adjacent to the south of ABP South.	**Moderate** - Gently sloping ground associated with the coastal plain intensively managed for agriculture and dominated by arable crops. The aspect area has limited value for biodiversity despite records of noTable Frable weeds.
The Leys (VLFGLLH938)	Less than 1km to the south of the Gileston Old Mill Road improvement works site	**Low** - Artificial habitat consisting of pulverised fuel ash spoil in varying stages of restoration/colonisation supports a secondary flora including orchids. However, it is considered of low biodiversity value
Vale of Glamorgan (VLFGLLH203)	Falls within the red line boundary of the Waycock roundabout improvement area.	**Low** - Built-up area encompassing Barry. Coastal fringe, gardens, vegetated steep slopes, amenity grasslands and sites such as Cadoxton Ponds provide the focus for biodiversity interest. Small areas of calcareous grassland are associated with the coastal fringes at Cold Knap Point and Fryers Island

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Night Time Lighting

Lighting Levels and Impact on Night Time Landscape Character

The site visit demonstrated that the existing MoD St. Athan base is a visually prominent feature of the landscape at night time, notably due to the lighting of the DSG hangar. Figures 8.25-8.26 shown in appendix 8, visual assessment baseline demonstrate night time lighting levels experienced during the night time site visit. However, other sources of night time lighting were evident on the site from the surrounding landscape including:

- Lighting along the perimeter fence;
- Lighting along existing roads within the perimeter fence;
- Lighting of the entrance points to the existing hangars at Picketston; and
- Street lamps lighting roads at West Camp.

The following are also notable due to their high levels of illumination. They are visible from elevated positions surrounding the site, including the A48 to the north and also from elevated sections of roads nearer to the site, for example from St. Athan Road:

- Aberthaw Power Station to the south east of the site;
- Cardiff Airport to the south east of the site;

The Visual and Sensory Aspects Areas defined by the *LANDMAP* assessment Table F16 above) were used as the basis of the assessment of night time lighting effects on landscape character. Each of the *LANDMAP* assessment aspect areas which fall within the site boundary were used in the assessment and sources of night time lighting were noted. The impact of the existing night time lighting on the character of each of the Visual and Sensory aspect areas after night fall was noted.

Heritage Coast Hinterland

With the exception of the B4265 this is a very dark landscape. The section of the aspect area falling within the site itself (to the south of Llantwit Road) is also very dark, with no existing light sources. The darkness of the aspect area itself emphasises the prominence of highly lit surrounding features including the DSG hangar the cooling tower of Aberthaw power station, both of which are situated outside of the aspect area.

Existing views northwards of the highly lit DSG hangar are a feature of night time views. The resultant sky glow above the site is evident from sections of the aspect area where it is not possible to actually see the DSG hangar. Views of this highly lit feature detract from the rural character.

MoD St Athan

There are number of features within this aspect area which have notably high levels of lighting. The most obvious example being the particularly prominent DSG hangar. It should however be noted that whilst the central section of the site has features with high levels of lighting, Picketston to the north of the site (and of the aspect area) has very low lighting levels.

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Due to existing night time lighting within this aspect area, its prevailing night time landscape character is less sensitive to increased lighting levels. However, low levels of lighting in the surrounding aspect areas, increase the prominence of features within MoD St Athan and existing highly lit features do detract from the more rural character of surrounding aspect areas.

Lias Plateau

The rural roads which cross this landscape generally have no lighting. However, occasional street lamps are located close to individual residencies and more extensively within settlements such as Llanmaes.

The highly lit DSG hangar is a key feature of night time views. The resultant sky glow above the site is visible from parts of the Lias Plateau aspect area where it is not possible to actually see the DSG hangar. Lighting associated with the hangar again detract from the rural character of this aspect area.

Evaluation of Sensitivity

Table F21 (overpage) summarises the sensitivity attributed to each of the landscape receptors identified in the baseline, by reference to landscape condition, value and capacity to accommodate change:

- *Landscape Condition* refers to the state of repair of the elements and features, their integrity and intactness;
- *Landscape Value* refers to the relative value or importance attached to the landscape (often as the basis for designation or recognition) which expresses national or local consensus because of its particular qualities including perceptual aspects such as scenic beauty, tranquillity or 'wildness', cultural associations or other conservation issues.
- *Landscape Capacity* concerns the ability of a particular landscape to absorb change without unacceptably adverse effects on its character.

Criteria adopted in establishing the level of Landscape Sensitivity are as follows:

Category	Criteria
High	Landscape of high sensitivity where in terms of landscape character, condition, and value, there is limited capacity to accommodate change and limited scope for mitigation i.e. having: • Valuable elements, features and land uses that combine to form an area of strong, positive and distinctive character. A landscape in a good condition that may also have some rarity and a low potential for replacement or mitigation. • Exceptionally high or high value: protected at international or national level (World Heritage Site / National Park/AONB). The management objectives of these areas may be to conserve existing character. (However, some designated landscapes may also include areas of medium or low landscape sensitivity).

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Category	Criteria
Medium	Landscape of medium sensitivity exhibiting positive character though with evidence of degradation/erosion of some elements and features i.e. having: • Generally positive character, in reasonable condition, with some valuable elements and features, and/or evidence of degradation/erosion, with opportunities for replacement or mitigation. • Medium value: protected at regional level (e.g. an Area of 'Great Landscape Value') or at a non-designated local level where there is evidence of local value and use.
Low	Landscape of low sensitivity where in terms of landscape character, condition, and value, there is greatest scope for landscape change in the form of development, mitigation and/or enhancement i.e. having: • Poorly defined character, in poor condition, with a low incidence or absence of valuable elements or features. Change is unlikely to be negative, with scope for scope restoration, enhancement or the creation of a new landscape. • Low Value: non-designated landscape which may have some redeeming elements or features, where management objectives may be more focused on landscape enhancement.

Receptors having 'Low' sensitivity are excluded from the assessment reported at Chapter 7 as effects are not predicted to be significant.

Table F21 excludes LANDMAP Historic Aspect Areas as no evaluation judgements are made as part of the historic LANDMAP assessment. The assessment of the historic nature of the landscape is reported as part of the Cultural Heritage chapter of the ES. It therefore is not assessed as a potentially significant element within the landscape chapter.

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Table F21 Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Landscape Elements within the site red line boundaries			
Category A trees and trees with TPOs within the main site red line boundary including the route of the waste water treatment pipeline	The only trees with tree preservation orders placed on them, within the main site boundary are located on the eastern boundary of the Picketston external training area. All other trees are not subject to TPOs, but a small number are categorised as Category A by the tree survey undertaken by Amenity Tree Care Ltd., July 2007	High	As set out in the tree survey completed by Amenity tree care, Category C trees are of low quality and value, and Category R trees are recommended for removal. The loss of these trees would not be significant in EIA terms.
Category B trees within the main site red line boundary including the route of the waste water treatment pipeline. Hedgerow is also assessed within the arboricultrual assessment. Where this is classified as being of category b value it is also assessed as a landscape resource. Loss of hedgerow and it's effect on landscape character and landscape pattern is assessed separately.	No policy status	Medium	These trees are defined by the arboricultural survey as being of moderate quality and value.
Trees within the Waycock Cross roundabout red line boundary. Hedgerow is also assessed within the arboricultrual assessment. Where this is classified as being of category b value it is also assessed as a landscape resource. Loss of hedgerow and it's effect on landscape character and landscape pattern is assessed separately.	A small block of category B trees is located to the north of the red line boundary of the Waycock roundabout	Medium	As set out in the tree survey completed by Amenity Tree care, Category C trees are of low quality and value, and Category R trees are recommended for removal. The loss of these trees would not be significant in EIA terms.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Landscape pattern and scale within the main site red line boundary including the route of the waste water treatment pipeline	No policy status	Low	The landscape pattern and scale is not designated. The landscape scale is also not noted as a key characteristic of the LANDMAP aspect areas within the red line boundary
Landscape pattern and scale within the Waycock roundabout red line boundary	No policy status	Low	The landscape pattern and scale is not designated. The landscape scale is also not noted as a key characteristic of the LANDMAP aspect areas within the red line boundary
Built form within the main site red line boundary including the route of the waste water treatment pipeline	There are no landscape/townscape designations applied to buildings on the site. Listed Buildings do exist within the site boundary. However, these are assessed as part of the Cultural heritage Chapter.	Low	There are no buildings of landscape/townscape value within the main site boundary.
ENV 4 Special Landscape Area (Thaw Valley Sides)	Designated by the Vale of Glamorgan Unitary Development Plan (UDP) 2005	High	This landscape is designated at the local level by the Vale of Glamorgan as being a landscape worthy of preservation. The area is designated to protect the wooded valley sides.
ENV 5 Glamorgan Heritage Coast	Vale of Glamorgan Landscape Designation (UDP 2005)	High	This landscape is designated at the local level by the vale of Glamorgan as being a landscape worthy of preservation. It is designated for its scenic beauty and the scientific interest of its geology, ecology and cultural heritage.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Conservation Area			
Flemingston Llanbethery Llancadle Lancarfan East Aberthaw Gileston Boverton Lanmaes Llanminhangel	Conservation Areas	High	These areas have been designated by the Local Authority as they are judged by the Local Authority to have special architectural or historic interest. Their character and appearance is judged by the Local Authority to be worth protecting or enhancing.
Surrounding Landscape patterns and scale			
The airfield and the hangers to the north	No designations apply. The area falls within the LANDMAP Visual and sensory Aspect Area MoD St. Athan (VLFGLVS456) which is judged by the LANDMAP assessment to have a low overall evaluation judgement in terms of visual and sensory aspect (landscape pattern and scale being a factor which contributes to the Visual and Sensory characteristics)	Low	There are no features which contribute to a notably distinctive or pleasing landscape pattern
East Camp where the buildings are set on a grid road pattern.		Medium	Although the area is judged to have a low overall evaluation by the LANDMAP Assessment, the built form and associated landscape planting creates a strong grid pattern. The sense of order that this landscape creates appears pleasing and fitting within a military setting.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Arable fields in the southern section of the existing MoD St.Athan Site, to the south of the runway	No designations apply. The area falls within the LANDMAP Visual and sensory Aspect Area Heritage Coast Hinterland (VLFGLVS890) which is judged by the LANDMAP assessment to have a high overall evaluation judgement in terms of visual and sensory aspect (landscape pattern and scale being a factor which contributes to the Visual and Sensory characteristics)	Medium	The hedgerow lined arable fields create a distinctive and intact landscape pattern. However, the pattern is diluted by views of various military hangers and large barns on the skyline.
West of Picketston where the fields are arable, medium sized and bound by hedgerow.	No designations apply. This area is split between two LANDMAP Visual and sensory Aspect Area one being MoD St. Athan (VLFGLVS456) which is judged by the LANDMAP assessment to have a low overall evaluation judgement in terms of visual and sensory aspect (landscape pattern and scale being a factor which contributes to the Visual and Sensory characteristics), and the other being Lias Plateau (VLFGLVS805) which is judged by the LANDMAP assessment to have a moderate overall evaluation judgement	Medium	The hedgerow lined arable fields create a distinctive and intact landscape pattern. However, the pattern is diluted by views of various military hangers and large barns on the skyline.
The small scale pastoral fields overlaying the undulating landscape south of Llanmaes	No designations apply. The area falls within the LANDMAP Visual and sensory Aspect Area Lias Plateau (VLFGLVS805)	High	The combination of small, hedgerow enclosed fields, the undulating landscape and the vegetated streams creates an area with a small scale and sheltered character
The larger fields (both pastoral and arable) to the west of Llanmaes	No designations apply. The area falls within the LANDMAP Visual and sensory Aspect Area Lias Plateau (VLFGLVS805)	Medium	The hedgerow lined fields creates a continuous but unexceptional landscape pattern, only occasionally interrupted by views of the B4265 and settlement at Llanmaes and Llantwit Major.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
The landform surrounding the B4265 between St.Athan and the River Thaw which drops into the River Thaw Valley sides. The valley sides are wooded, and this creates a sense of separation from the surrounding arable landscape.	No designations apply. The area falls within the LANDMAP Visual and sensory Aspect Area Heritage Coast Hinterland (VLFGLVS890) which is judged by the LANDMAP assessment to have a high overall evaluation judgement in terms of visual and sensory aspect (landscape pattern and scale being a factor which contributes to the Visual and Sensory characteristics)	Medium	The hedgerow lined fields, and views of the wooded valley sides creates a consistent landscape pattern, and the wooded valley sides creates a notable sense of enclosure.
The hedgerow lined pastoral fields, and woodland blocks north and north west of Waycock Cross	No designations apply. The roundabout falls at the junction of for visal and sensory aspect areas as defined by the LANDMAP assessment, representing the varying landpsace patterns and scales between the pastoral fields to the south and the built edge of barry to the south and east.	low	This urban fringe location has no distinctive landscape pattern or scale.
Visual and sensory LANDMAP aspect areas			
1. Heritage Coast Hinterland **(VLFGLVS890)**	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	High	This aspect area is given an **outstanding** overall evaluation score by the *LANDMAP* assessment because of its unspoilt nature as a rolling coastal lowland plateau
2. Lias Plateau (VLFGLVS805)		Medium	LANDMAP attributes a **high** value to this area as it offers access to attractive views of fields, hedgerows and wooded areas on valley sides and ridge tops in pleasing compositions.
3. MoD St. Athan (VLFGLVS456)		Low	This aspect area is given a **low** overall evaluation score by the LANDMAP assessment as it presents no picturesque scenic views but rather a number of elements in apparently discordant composition.
4. Thaw Power Station (VLFGLVS998)		Low	This aspect area is given a **low** overall evaluation score by the LANDMAP assessment as the overall sense of the power station is a large detractor in the landscape despite its distinctiveness and positive management.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
5. Llantwit Major (VLFGLVS235)		Medium	This aspect area is given a **moderate** overall evaluation score by the LANDMAP assessment Core is well maintained with stone buildings set in medieval street pattern offering picturesque views. Outer housing areas spoil intrinsic pattern of settlement and provide minor detractor to wider landscape in parts. The core is well maintained and is of consistent and distinctive character. This is not reflected in the outer areas and newer commercial premises.
6. Lower Thaw Valley Sides (VLFGLVS110)		**High**	LANDMAP attributes a **high** value to this area. The aspect area offers accessibly viewed attractive views of fields, hedgerows, and wooded areas on valley sides and ridge-tops in pleasing compositions.
7. Llancarfan and Waycock Valleys (VLFGLVS453)		**Medium**	LANDMAP attributes a **high** value to this area. The aspect area possesses a high quality scenic landscape with many picturesque views to fields, hedgerows and steeply wooded valley sides in an aesthetic composition.
8. Central Vale Ridges and Slopes (VLFGLVS146)		**Medium**	**Moderate** - The aspect area offers many views to hedgerows, fields, and treed areas in harmonious composition. However the flat nature of the aspect area's landscape (level plateau) makes for a less pleasing composition of elements than the more undulating or hilly areas.
9. Heritage Coastal Strip (VLFGLVS950)		**High**	**Outstanding** - The area presents many views of outstanding quality to sheer cliffs of clear rock formation and patterns, neighbouring undeveloped beaches plus sea.
10. Glamorgan Heritage Coast Intertidal (VLFGLVS920)		**high**	**Outstanding** - There are superb views along coast and out to sea with high scenic quality of sand and wavecut platforms.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
11. Aberthaw Estuary (VLFGLVS569		**Low**	This aspect area is given a **low** overall evaluation score by the LANDMAP assessment as a result of the degraded landscape that is a detractor.
12. Aberthaw Quarry (VLFGLVS742)		**Low**	LANDMAP attributes a **low** sensitivity to this area as the quarry and works are a major detractor.
13. Lower Thaw Valley Floor (VLFGLVS305)		**Medium**	**Moderate** - The aspect area offers views to a distinctive flat landscape of pasture, drainage channels and marshy areas but this is spoilt to an extent by the power lines/pylons. It has a consistent character but elements such as hedgerows are gappy and overgrown in places.
14. Llandow Industrial Estate (VLFGLVS467)		**Low**	This aspect area is given a **low** overall evaluation score by the LANDMAP assessment. Although the aspect area offers some interesting views to WII hangars and runways the area is generally marred by commercial development and associated clutter which is unsightly. The integrity of the area has been severely affected, by industrial and commercial development, by poorly maintained landscape areas and by rubbish dumping.
15. Nant Tre Gof Valley (VLFGLVS952)		**Medium**	This aspect area is given a **moderate** overall evaluation score by the LANDMAP assessment. The aspect area offers many attractive views including historical settlements and buildings set in pastoral landscapes and woodlands.
16. Cardiff Wales Airport (VLFGLVS723)		**Low**	This aspect area is given a **low** overall evaluation score by the LANDMAP assessment. The aspect area offers few views of a pleasing picturesque quality, but rather views to an open and flat landscape dominated by fences and the huge airport terminal.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
17. Upper Waycock Valley/Dyffryn Area (VLFGLVS608)		**Medium**	LANDMAP attributes a **high** value to this area. The LANDMAP assessment notes that the aspect area has broad, pleasing views to well managed countryside with a coherent field pattern and woodlands with settlements well integrated with the landscape and surrounding vegetation. The settlements have stone walls and streams also add to the picturesque quality of this area. The area is unspoilt, well managed and is in good and consistent condition throughout. However, the roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.
18. Rhoose Hinterland (VLFGLVS641)		**Medium**	LANDMAP attributes a **high** value to this area. This area is attributed a high overall evaluation in the LANDMAP assessment. However, the roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.
Barry (VLFGLVS219)		**Low**	This aspect area is given a **low** overall evaluation score by the LANDMAP assessment. This area is attributed a low overall evaluation in the Landmap Assessment and for the purposes of this assessment has a low sensitivity. The roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Llancarfan and Waycock Valleys (VLFGLVS453)		**Medium**	LANDMAP attributes a **high** value to this area. This area is attributed a high overall evaluation in the LANDMAP Assessment. However, the roundabout and edge of Barry are noted as detractors in terms of overall character and sense of tranquillity.
Historic LANDMAP aspect areas within the main site red line boundary including the waste water treatment pipeline			
1. Vale of Glamorgan coast littoral (VLFGLHL001) 2. South Vale Communication Corridor (VLFGLHL002) 3. Aberthaw Industrial (VLFGLHL028) 4. Porthkerry Rural (VLFGLHL030) 5. MoD St. Athan (VLFGLHL031) 6. Llancarfan (VLFGLHL032) 7. RAF Llandow (VLFGLHL033) 8. St. Donats, Monknash and St. Brides Majo (VLFGLHL036) 9. Fonmon Castle (VLFGLHL038) 10. Old Beaupre (VLFGLHL040) 11. Thaw River Valley (VLFGLHL049)	* **No evaluation judgements are made as part of the Historic LANDMAP Assessment**		

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Historic LANDMAP aspect areas within the main site red line boundary including the waste water treatment pipeline			
12. Llandow Rural (VLFGLHL051) 13. Llamihangel Place (VLFGLHL041) 14. Llysworney and Llandough (VLFGLHL052 15. Rhoose (VLFGLHL029) 16. Dyffryn 17. Barry (VLFGLHL004)			
Cultural Landscape Aspect Areas within the main site red line boundary including the waste water treatment pipeline			
1. Fonmon Castle (VLFGLCL040)	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	Medium	The LANDMAP assessment attributes a **moderate value to this area.** The write up states that this is not to disparage its historical importance, but to value its cultural essence as a part time leisure destination.
2. Llancarfan (VLFGLCL021)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area** - Llancarfan village stands within a Registered landscape of Outstanding Historical Interest and aesthetic quality and contains a designated Conservation Area. The registered landscape represents 'one of the best surviving and most complete typical parts of the Vale of Glamorgan.
3. West Aberthaw power Station, cement Works (VLFGLCL003)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area.** It is judged by Landmap to be of 'outstanding' value due to the prominent industrial structures located within an otherwise rural and coastal landscape.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
4. Llantwit Major (VLFGLCL005)		High	The LANDMAP assessment attributes a **high** value to **this area.** The Landmap data states that 'the essence of the place has been compromised by the permitting of inappropriate and unattractive development'. However, the value of the area is judged to be high as the village possesses a reasonably well preserved historic core and the village has strong associations with Early Christianity.
5. Heritage Coast (VLFGLCL002)		High	The LANDMAP assessment attributes a **high** value to **this area.**The Heritage coast has been designated by the local authority. It stretches for 14 miles from St. Athan westwards to the Ogmore River and sits adjacent to the south of the site. The landscape comprises extensive cliff lands of varying height, moorland and dips and hollows of greenery.
6. RAF Station St. Athan (VLFGLCL004)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area** The LANDMAP data states that 'the RAF station is uniquely self contained with a specific cultural character markedly different from that of the surrounding landscape'.
7. Llandow Industrial estate (VLFGLCL026)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area** The Landmap information states that the area has 'moderate' value and that 'at present it would appear that the developments are principally of local vale to residents of the Vale'.
8. Llandow Car Racing Circuit (VLFGLCL027)		High	The LANDMAP assessment attributes a **high** value to **this area.** The circuit occupies part of a WWII redundant airfield and has been used to host car and motorcycle racing events regularly since early 1970s. The facility is alien to the essentially agricultural nature of the surrounding landscape.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
9. Vale of Glamorgan Rural Landscape (VLFGLCL039)		High	The LANDMAP assessment attributes a **high** value to **this area.** The Landmap information states that 'Vale of Glamorgan is essentially an evolved agricultural landscape with the evidence of its historic past and the unspoiled nature of the landscape is evidenced by the designations and 16 registered parks and gardens, as well as the high number of Conservation Areas'. None of these coincide with landtake for the proposed development.
10. St. Donats and Atlantic College (VLFGLCL006)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area** The Landmap information states that 'St Donat's Castle has evolved into both a world known educational establishment and a locally important centre for the arts, and that Atlantic College is the only United World College in the UK'
11. Vale of Glamorgan Railway (VLFGLCL009)		High	The LANDMAP assessment attributes a **high** value to **this area** as an example of determinedly successful local authority planning policies
12. Rural Village Conservation Areas (VLFGLCL028)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area** as a group of historically and socially important settlements.
13. Rhoose & Fontygary Leisure Park (VLFGLCL038)		High	The LANDMAP assessment attributes a **high** value to **this area** as planned housing and leisure developments meeting contemporary social needs.
14. Cardiff International Airport (VLFGLCL010)		High	The LANDMAP assessment attributes a **high** value to **this area** as an example of a regional airport with aspirations to become more truly "international"

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
15. Barry (VLFGLCL012)		High	The LANDMAP assessment attributes a **high** value to **this area..** This area is attributed a high overall evaluation in the LANDMAP Assessment due to 'evident determination to create a strong future through regeneration' [4]
Geological Landscape Aspect Areas			
1. Moulton (VLFGLGL170)	This rationale is based on the ILE Gidance	Medium	The LANDMAP assessment attributes a Moderate value to **this area** . This aspect area consists of segment of broad Blue Lias' plateau (Lower Jurassic) including well developed internal scarps where softer Lavernock Shales between limestone-shale St Mary's Well Bay and Portkerry members have been eroded back to form steep slope above platform of former and below plateau of latter member. Steep sided cwms also typical. No SSSI/GCR, geological SINC, 2nd tier or RIGS sites are found.
2. Ogmore-Nash-Breaksea (VLFGLGL221)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area** This aspect area corresponds to the cliffs and dominantly rocky foreshore between Ogmore-by-sea and Breaksea Point on the west side of the Thaw Estuary. Most characteristic are the vertical cliffs of alternating limestone and shales of the Portkerry Member of the Lower Lias Formation, which include the spectacular Nash Point. Lower cliffs near Ogmore-by-sea include famous exposures of marginal Triassic and Jurassic deposits unconformably overlying Carboniferous limestone. Cliffs are cut by deep cwms. Monknash Coast SSSI and Southerndown Coast SSSI fall within its boundary.

[4] Vale of Glamorgan Landmap data, Countryside Council for Wales, (http://landmap.ccw.gov.uk) Barry Aspect area VLFGLCL012,

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
3. St. Hilary (VLFGLGL282)		High	The LANDMAP assessment attributes a **high** value to **this area.**This aspect area corresponds to the cliffs and dominantly rocky foreshore between Ffontgari Bay and Barry, to the east of the Thaw estuary. Most characteristic are the vertical cliffs of alternating limestone and shales of the Portkerry Member of the Lower Lias Formation (Lower Jurassic), which locally have been breached by inland quarries in similar materials. No SSSI/GCR, geological SINC, 2nd tier or RIGS sites are found.
4. Ewenny-Penllyn (VLFGLGL492)		High	The LANDMAP assessment attributes an **Outstanding value to this aspect area** Continuation of low, broad ridge of Carboniferous limestone with flanking deposits of marginal facies Triassic and Jurassic. Dry valleys present. Ewenny and Pant Quarries SSSI (part - for latest Triassic (Rhaetian) mammals in fissures) and Potential RIGS/SINC sites include key sections in Carboniferous limestone in Rhuthin area and lead mines/deposits near Colwinston and Llangan are present in this aspect area
5. Thaw-Waycock (VLFGLGL514)		Medium	The LANDMAP assessment attributes a **Moderate** value to **this area** Dendritic river-flood plain system in typically steep sided narrow valley, with local small alluvial fans where tributaries enter. Estuary of main Thaw River is distinctly fan shaped but significantly modified by industrial activity, including a power station, associated ash dumps and aggregate extraction.
6. Coed Hills (VLFGLGL614)		Medium	The LANDMAP assessment attributes a M**oderate** value to **this area.** Small segment of dissected 'Blue Lias' plateau with distinctive tabular hills with scarp face in Lavernock Shales Member, capped by Portkerry Member limestone-shales, on a platform of St. Mary's Well Bay Member.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
7. Llanwit-St. Athan (VLFGLGL863)		Medium	The LANDMAP assessment attributes a Moderate value to **this area.** Broad, low, dissected coastal plateau underlain by Lias (Lower Jurassic) with steep sided valleys and short steep cwms cut into cliffs adjacent to the coast. Level plateau includes two airfields. Some periglacial deposits (head) in some valleys and cwms. Part of Monknash Coast SSSI with Pleistocene-Holocene features falls within the area, but no geological SINC, 2nd tier or RIGS sites are found.
8.Llanbethery(VLFGLGL953)		Medium	The LANDMAP assessment attributes a Moderate value to **this area.** Segment of dissected 'Blue Lias' plateau, including internal scarps where softer Lavernock Shales Member has been eroded to steep slope below plateau of limestone-shale Portkerry member and above platform of St.Mary's Well Bay Member. Steep sided cwms also present.
9. Barry-Rhoose (VLFGLGL962)		High	The LANDMAP assessment attributes a **high** value to **this area.** This aspect area covers the entire red line boundary and has an overall high evaluation as a result of the presence of key inland exposures of Lower Jurassic Blue Lias Formation in active and disused quarries (e.g. near east Aberthaw and Font-y-gary) , with scientific and educational potential
Landscape Habitats Aspect areas			
Heritage Coast (VLFGLLH325)	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	High	**LANDMAP attributes an outstanding value judgement to this area**. It is an ntertidal habitats largely characterised by limestone cliffs, wave cut platforms and cobbles beaches.
Lower Thaw Valley (VLFGLLH350)		Medium	**LANDMAP attributes an high value judgement to this area** This aspect area is a grazing marsh with tidal influence supporting typical salt marsh plant species and located in a sheltered section of the lower Thaw Valley

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Table F.21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Cowbridge South – Thaw Valley (VLFGLLH436)		High	**LANDMAP attributes an high value judgement to this area** Narrow valley contained by steep slopes supporting semi-natural broadleaved woodland (ash dominated). Grasslands of the floodplain are generally improved. The Watercourse and occasional ox-bow lakes and ponds are focus of biodiversity interest.
Cowbridge West (VLFGLLH435)		High	**LANDMAP attributes an outstanding value judgement to this area**. Intensively managed agricultural landscape west of Cowbridge consisting of large, improved grassland and scattered arable fields with intensively managed field boundaries.
Coastal Grasslands & Cwms (VLFGLLH523)		High	**LANDMAP attributes an outstanding value judgement to this area**. Exposed limestone sea cliffs and coastal grasslands of the cliff edge. Flushes provide habitats for a variety of notable plants and animals. Scrub woodland is associated with cwms/dissected river valleys perpendicular to the coastline and thus providing shelters for birds and mammals. The high proportion of habitats protected by site designations forms an interconnected mosaic of valuable habitats along the Vale coastline.
Ogmore-Llantwit Arable Belt (VLFGLLH582)		Medium	**LANDMAP attributes an moderate value judgement to this area** Intensive agricultural management supporting large fields of improved grassland and arable crops. Field boundaries, occasional ponds and minor watercourses largely provide the focus of biodiversity interest.
St Athan (VLFGLLH583)		Low	**LANDMAP attributes an low value judgement to this area** . Area largely modified by urbanisation. Biodiversity interest associates with amenity grasslands (gardens). Grasslands bordering the runways have possibly developed a relatively interesting neutral grassland community. Overall, it is a built-up area with limited value for wildlife.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Llantwit Major (VLFGLLH614)		Low	**LANDMAP attributes an low value judgement to this area**. Built-up area associated with Llantwit Major but the open areas of grassland and garden provide the focus for biodiversity interest.
Aberthaw River Valleys (VLFGLLH786)		Medium	**LANDMAP attributes an high value judgement to this area** . A mosaic of habitats centred on dissected river valleys that harbour floodplain grasslands of poorly drained character and steep valley slopes supporting semi-natural broadleaved woodland and occasional species-rich semi-improved neutral grasslands.
Aberthaw (VLFGLLH839)		Medium	**LANDMAP attributes an moderate value judgement to this area** of improved agricultural landscape is dominant and the underlying influences of limestone and proximity to the coast provide the conditions for fragments of notable grassland in relatively undisturbed areas such as road verges.
Rhoose-Moulton (VLFGLLH840)		Medium	**LANDMAP attributes an moderate value judgement to this area** . A landscape of undulating topography largely dominated by agriculturally improved ground. Field boundaries, minor watercourses and occasional semi-improved grasslands form focus of biodiversity interest.
Boverton (VLFGLLH897)		Medium	**LANDMAP attributes an moderate value judgement to this area**. Gently sloping ground associated with the coastal plain intensively managed for agriculture and dominated by arable crops. The aspect area has limited value for biodiversity despite records of noTable Frable weeds.
The Leys (VLFGLLH938)		Low	**LANDMAP attributes an low value judgement to this area** . Artificial habitat consisting of pulverised fuel ash spoil in varying stages of restoration/colonisation supports a secondary flora including orchids. However, it is considered of low biodiversity value

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Vale of Glamorgan (VLFGLLH203)		Low	**LANDMAP attributes an low value judgement to this area** Built-up area encompassing Barry. Coastal fringe, gardens, vegetated steep slopes, amenity grasslands and sites such as Cadoxton Ponds provide the focus for biodiversity interest. Small areas of calcareous grassland are associated with the coastal fringes at Cold Knap Point and Fryers Island
Visual and Sensory Aspect Areas within the Waycock roundabout boundary 1km study area			
Upper Waycock Valley/Dyffryn Area (VLFGLVS608)	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	High	The LANDMAP assessment notes that the landscape has a **high** value due to the broad, pleasing views to well managed countryside with a coherent field pattern and woodlands with settlements well integrated with the landscape and surrounding vegetation.
Rhoose Hinterland (VLFGLVS641)		High	The LANDMAP assessment notes that the landscape has a high value due to the tranquil, rural landscape character.
Barry (VLFGLVS219)		low	The LANDMAP assessment notes that the landscape has a low value due to the poor quality illegible urban form with industrial detractors.
Llancarfan and Waycock Valleys (VLFGLVS453)		High	The LANDMAP assessment notes that the aspect area possesses a high quality scenic landscape with many picturesque views to fields, hedgerows and steeply wooded valley sides in an aesthetic composition
Historic Aspect Areas within the Waycock roundabout boundary 1km study area			
Llancarfan Dyffryn Porthkerry Rural - VLFGLHL030 Barry - (VLFGLHL004)	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	No evaluation	No evaluation judgements are made as part of the historic LANDMAP assessment. The historic nature of the landscape is assessed as part of the Cultural Heritage chapter of this EIA. It therefore is not assessed as a potentially significant element within the landscape chapter.

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Cultural Landscape Aspect Areas within the Waycock roundabout boundary 1km study area			
Vale of Glamorgan Rural Landscape (VLFGLCL039)	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	High	This area is attributed a high overall evaluation in the Landmap Assessment due to the evolved agricultural nature of the landscape which contains evidence of its historic past. The LANDMP Assessment notes that the unspoiled nature of the landscape is evidenced by the 16 registered parks and gardens, as well as the high number of Conservation Areas. It should be noted that none of the 16 registered Historic Aspect Areas or Conservation Areas fall within the Waycock roundabout red line boundary or the surrounding 1km study area.
Barry (VLFGLCL012)		High	This area is attributed a high overall evaluation in the Landmap Assessment
Geological Aspect Areas within the Waycock roundabout boundary and 1km study area			
Barry-Rhoose VLFGLGL962	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	High	This aspect area covers the entire red line boundary and has an overall **high** evaluation as a result of the presence of key inland exposures of Lower Jurassic Blue Lias Formation in active and disused quarries (e.g. near east Aberthaw and Font-y-gary) , with scientific and educational potential
Landscape Habitat Aspect Areas within the Waycock roundabout boundary and 1km study area			
Vale of Glamorgan (VLFGLLH203)	LANDMAP Aspect areas as defined by Countryside Council for Wales (Countryside Council for Wales website http://landmap.ccw.gov.uk)	Low	The LANDMAP assessment attributes a **low** sensitivity to this aspect area as the area is urban and the Landmap Assessment states that it has limited value for wildlife
Rhoose Moulton (VLFGLLH840)		Medium	For the purposes of this assessment, in line with the Landmap data the area is attributed a **medium** sensitivity in terms of habitat

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Table F21 (continued) Landscape Evaluation

Receptor	Policy status	Landscape Sensitivity	Rationale
Lighting levels and impact on night time landscape character			
Heritage Coast Hinterland **(VLFGLVS890)**	Based on guidance established in the Institute of Lighting Engineers Guidance Notes for the Reduction of Obtrusive Light (2005)	High	The site falls within a rural area and therefore within category E2 'Low district brightness areas'. However, due to the proximity to the Glamorgan Heritage Coast designation, it falls adjacent to category E1 'Intrinsically dark landscapes' which cover National Parks, Areas of Outstanding Natural Beauty, and other nationally designated landscapes.
RAF St Athan (VLFGLCL004)		High	
Lias Plateau (VLFGLVS805)		High	

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