RPS

APPENDIX E.1

HYDRUS

LANDSCAPE AND VISUAL ASSESSMENT METHODOLOGY

April 2010

1 Assessment Methodology

1.1 Introduction

1.1.1 The term landscape commonly refers to the view or appearance of the land. However, the landscape is a combination of both cultural and physical characteristics or components, which give rise to patterns that are distinctive to particular localities and help to define a 'sense of place'. The landscape is not therefore simply a visual phenomenon but relies upon other influences including topography, land use and management, ecology and historical and cultural associations.

1.1.2 This Landscape and Visual Impact Assessment provides a description and evaluation of the existing landscape on and surrounding the site and identifies visual receptors within the study area. This baseline assessment will then be used to assess the predicted landscape and visual impacts arising from the proposed re-development. The impact assessment identifies and assesses both permanent and temporary or construction phase impacts, together with mitigation measures proposed, in order to avoid or reduce potential adverse landscape and visual impacts.

1.1.3 No single prescribed methodology exists for assessing landscape and visual impact. However, the main guidance is provided in the "Guidelines for Landscape & Visual Impact Assessment" (GLVIA) (published by the Institute of Environmental Management and Assessment and The Landscape Institute) (2002) and Landscape Character Assessment Guidance for England and Scotland published by the Countryside Agency and Scottish Natural Heritage (2002).

1.1.4 Assessment of the impact of the Hydrus proposals on historic landscape character and the settings of Registered Parks and Gardens, Conservation Areas and Listed buildings is contained in Chapter 14 of the DEEA: Cultural Heritage and Archaeology.

1.1.5 West Berkshire Council has been consulted regarding the approach and methodology for the AWE landscape assessments.

1.2 Baseline Methodology

1.2.1 The first stage of the assessment established the landscape and visual baseline on and surrounding the site initially through desktop studies and subsequently through field surveys. Desktop studies included the review of existing information from the Countryside Agency and in Structure and Local Plans, together with existing contextual reports (as prepared by Atkins) maps, aerial photographs and existing landscape studies covering the site and the surrounding area.

1.2.2 The baseline field surveys were originally undertaken in 2005 and were updated in 2007, December 2008 and January 2009, identifying existing landform, significant vegetation, landscape character and the identification of visual receptors within the study area. A photographic survey was undertaken from selected viewpoints in the North Wessex Downs Area of Outstanding Natural Beauty. The AONB is situated 2.6km away from the development site at its nearest point, to the north of AWE Aldermaston.

1.2.3 The desktop studies and field surveys have been used to describe the character of the landscape on and surrounding the site and to identify sensitive landscape and visual receptors i.e. those landscape elements and features and visual receptors that are likely to be directly or indirectly affected by the proposed re-development.

1.2.4 The baseline study then evaluates the condition and value of the landscape, identifying distinct character areas and or / generic character types through the process of analysing those factors which contribute to defining the character (i.e. those landscapes which have a recognisable pattern of elements and or / features that occur consistently in a given landscape). The following table sets out the criteria and definitions which have been used in the baseline assessment:

Table 1 Landscape Condition/Quality Criteria

Quality Classification	Evaluation Criteria
Exceptional	▪ Beautiful, distinctive, unique or outstanding natural landscape character; ▪ Strong landscape structure, characteristics, patterns, balanced combination of landform and landcover; ▪ Good condition - appropriate management for land use and landcover; ▪ Distinct features worthy of conservation; ▪ Unique sense of place; ▪ No detracting features.
High	▪ Very attractive, semi-natural or farmed landscape with distinctive or unusual features; ▪ Strong landscape structure, characteristic patterns and balanced combination of landform and landcover; ▪ Appropriate management for land use and landcover but potentially scope to improve; ▪ Distinct features worthy of conservation; ▪ Strong sense of place; ▪ Occasional detracting features.
Good	▪ Attractive landscape with some distinctive features; ▪ Recognisable landscape structure, characteristic patterns and combinations of landform and landcover are still evident; ▪ Scope to improve management for land use and landcover; ▪ Some features worthy of conservation; ▪ Sense of place; ▪ Some detracting features.
Ordinary	▪ Typical, commonplace farmed landscape with limited variety or distinctiveness; ▪ Distinguishable landscape structure, characteristic patterns of landform and landcover often masked by land use; ▪ Scope to improve management of for land use and landcover; ▪ Some dominant features worthy of conservation; ▪ Some detracting features.
Poor	▪ Monotonous, uniform landscape which has lost most of its natural features; ▪ Weak or degraded landscape structure, characteristic patterns of landform and landcover are often masked by land use; ▪ Mixed land use evident; ▪ Lack of management and intervention has resulted in degradation; ▪ Frequent dominant detracting features. ▪ Disturbed or derelict* land requires treatment.

Source: Modification of criteria contained in the *Guidelines for Landscape and Visual Impact Assessment* (2002)

1.2.5 Landscape value is concerned with the relative value or importance that is attached to different landscapes. The assessment has considered statutory designations and takes into account other values to society, which may be expressed by the local community or consultees. The following table sets out the criteria and definitions used in the baseline assessment to determine landscape value:

Table 2 Landscape Value Criteria

Criteria	Typical Scale	Definition*
Very High	International	▪ Very attractive and rare; ▪ Exceptional landscape quality; ▪ No or limited potential for substitution. ▪ eg. World Heritage site, National Park, AONB or key elements/features within them.
High	National	▪ Very attractive or attractive scenic quality and in part rare; ▪ High or good landscape quality; ▪ Limited potential for substitution. ▪ eg. National Park, AONB, AGLV (or similar designation) or key elements within them.
Medium	Regional	▪ Typical and commonplace or in part unusual; ▪ Ordinary landscape quality; ▪ Potential for substitution. ▪ eg. Generally undesignated but value expressed through literature and cultural associations or through demonstrable use.
Low	Local	▪ Monotonous, degraded or damaged; ▪ Poor landscape quality; ▪ Can be substituted. ▪ eg. Certain individual landscape elements or features may be worthy of conservation and landscape either identified or would benefit from restoration or enhancement.

Source: Modification of criteria contained in the *Guidelines for Landscape and Visual Impact Assessment* (2002)

* Definitions, examples and features are not exclusive to each value category ie. Not all parts of an AONB can necessarily be considered either attractive or very attractive depending upon local character and condition.

Visual Analysis

1.2.6 The LI/IEMA publication 'Guidelines for Landscape and Visual Impact Assessment' (2002, Part 6 and Appendix 7) notes that either manual or computer generated techniques may be used to help delineate the theoretical zone of theoretical visibility (ZTV) that the tallest elements of existing and proposed buildings may have upon surrounding receptors. The ZTV can be defined as the area from which all or part of the buildings may be visible.

1.2.7 The finished floor level for the buildings within the Hydrus development site would be 100.3m AOD. The proposed main research and development building would be 20m tall (120.3m AOD) at its crown, with the exhaust stack and fume cupboard flues at a maximum height of 123.8m AOD. A Lightning Protection System (LPS), consisting of 8 masts with a tapering profile (140.3m AOD at the tip) and catenaries, surrounds the research and development building. The support building is located to the east of the main building. It has a stepped roof, with the highest point at 112.3m AOD. The stack for this building is located within the tallest, eastern roof section and will project to 115.3m AOD.

1.2.8 Buildings located close to the Hydrus project site, towards the centre of the Aldermaston site, are up to 28.8m tall (132.1m AOD) with stacks up to 33.9m tall (approximately 137m AOD). The stacks of the Boiler House on the eastern boundary of the Aldermaston site are 48.9m tall (150.8m AOD). The ZTV of the proposed development has therefore been modelled on computer for the existing and proposed structures to indicate the extent of potential visibility. The existing building heights on site were modelled using GIS data provided by AWE.

1.2.9 The AWE Aldermaston site lies on a plateau at 100m to 105m AOD. The site is enclosed by woodland copses and heathland woodland. Whilst the woodland blocks have been modelled, the existing hedgerows and smaller tree belts have not been considered in the ZTV model and therefore provide further enclosure to the site than the model suggests.

1.2.10 The review of previous studies (Environment Site Setting Exercise, Burghfield, Atkins, 2005) and the 1:25,000 scale Ordnance Survey Explorer Map verified by site survey and computer modelling (with Key Terrafirma), indicates that the potential Zone of Theoretical Visibility exerted by AWE Aldermaston on surrounding areas is constrained by the ridge and valley topography, significant vegetation and built form.

1.2.11 Areas of significant woodland that act as a visual screen were included within the ZTV mapping in addition to contour information, site built development and local settlements; an assumed height of 15m was adopted for all significant woodland and 9m for settlements. However, the localised effect of other screening vegetation (i.e. hedgerows), small scale built development, weather conditions or distance effects would help to limit views. As such, the actual ZTV for both the existing situation and proposed development would be less than that indicated by the broad mapped extent.

1.2.12 The ZTV was defined through desktop and field studies, and in accordance with previous AWE assessments, which suggested that the visual impact of the proposed re-development could be considered in three broad categories. Short-distance views have been defined as those from vantage points located within 2km from the site. Middle-distance viewpoints are those that fall between 2km and 5km from the site, middle to long distance views fall between 5km and 15km. No longer distance views (over 15km) have been considered, as part of this assessment as the development would not be readily discernable at this distance. The ZTV indicates the majority of potential views lie within 12km of the site.

1.2.13 Computer photomontage is the combining and manipulation of existing photographic images with computer generated elements to portray the visual effect of a proposed scheme. A series of photomontages have been prepared to illustrate the impact of the development proposals when viewed from key locations. These locations were agreed with West Berkshire District Council officers.

1.2.14 Digital photographs are taken using a fixed lens equivalent to 35mm film with 50mm focal length (as recommended in the Landscape Institute / Institute of Environmental Management and Assessment (IEMA) Guidelines, 2002). The same exposure setting was used for all the frames.

1.2.15 Where possible the site is placed in the middle of the view with frames taken either side to give the landscape context. The panoramas are photographed with the horizon in the centre using a level tripod which is rotated on the same grid co-ordinate to ensure individual frames are aligned. Viewpoint locations and reference features are recorded using a hand held GPS.

1.2.16 Panoramic views are produced by combining each frame within Adobe Photoshop. A 50% overlap is taken between frames to allow the sides of each photo to be removed when splicing to minimise distortion. Photographs are corrected for colour, brightness or contrast or all of these to ensure that image quality is optimised.

1.2.17 A 3d model of the scheme is set up and geo-referenced within CAD software to enable the generation of wirelines and/or renders. Cameras are set up to match the locations recorded on site using the GPS reference data.

1.2.18 Wireline views are generated for alignment on the photo panoramas. Features are included in the wireline to enable the correct alignment. Rendered views can be produced to place on the panoramas or the wirelines can be worked up to render quality using source photographic material. Adobe Photoshop is used to realistically merge the scheme into the views.

1.2.19 Presentation is laid out in Adobe InDesign in an A3 format. The A3 layout allows for a 75° field of view, which should be viewed at approximately 300mm from the image. Layouts show existing view and proposed view with distances to site and specific camera information all on the same sheet.

1.2.20 Groups of visual receptors affected by the existing development during the day and by associated lighting at night have been identified and the nature of the existing view described in the Visual Impact Schedules.

1.2.21 The sensitivity of visual receptors is dependent upon the location and context of the viewpoint, whether continuous, fragmented, or intermittent (i.e. the dynamic nature of a view gained while travelling through an area), the importance of views, and the occupation and activity of the visual receptor. Influences such as the number of receptors affected, popularity of views and the significance of the views in relation to valued landscapes or features determine the importance of views.

- **Higher sensitivity receptors:** includes viewers within residential properties (which are grouped together in settlement clusters) and Public Rights of Way users. The visual sensitivity to lighting impacts at night on residential properties is generally considered to be less sensitive than changes in daytime views as the majority of visual receptors would be located within lit rooms, often with the curtains drawn.

- **Medium sensitivity receptors:** may include people engaged in sports / formal outdoor recreation; dynamic views gained by the travelling population through or past the landscape.

- **Low sensitivity receptors**: includes people at their place of work, whose attention may be focussed on their work or activity and may be therefore less susceptible to changes in view.

1.2.22 The field assessment of the visual effects was undertaken from locations that have public access.

1.3 Impact Methodology

1.3.1 The second stage of the assessment process identifies the landscape and visual effects associated with the proposed development. The identification of impacts will clearly distinguish between those effects upon the physical landscape resource and those associated with visual amenity and views.

1.3.2 The effects are also considered in terms of their duration i.e. whether they are permanent (i.e. operational) or temporary (often associated with the construction phases of the re-development).

1.3.3 The effects are considered during the construction and operational phases. Night-time impacts would generally be less significant from residential properties as generally the visual focus is not concentrated on the outdoors (for example, a large proportion of the population draw curtains in main habitable rooms for privacy, therefore closing the outside world from the residential properties).

1.3.4 The landscape masterplan prepared as part of the Hydrus application proposals forms the basis of the mitigation measures in order to reduce the potential adverse landscape and visual effects of the proposed re-development. Mitigation will be considered in relation to the protection of existing trees on site, and the introduction of trees and native planting.

1.3.5 Other mitigation measures to improve the landscape quality and biodiversity opportunities within the site are also considered where appropriate.

1.3.6 The scale of the existing site and the proposed change, both beneficial and adverse, is assessed as set out in Table 3:

Table 3: Scale

Criteria	Definition
Major	The proposed changes form a dominant or immediately apparent feature within views that would significantly affect and change the overall character of the view.
Moderate	The proposal may form a visual and recognisable new element that would affect and change the overall character or view.
Minor	The proposals constitute only a minor component of wider views, which might be missed by the casual observer or receptor. Awareness of the proposals would not have a marked effect on the overall character or view.
Negligible	Only a very small part of the proposals would be discernible and / or they are at such a distance that they would be scarcely appreciated. Consequently they would have very little effect on the character or view.
Neutral	No part of the proposals, or work activity associated with it, would affect the existing character or be discernible in views.

Source: Modification of criteria contained in the *Guidelines for Landscape and Visual Impact Assessment* (2002)

Landscape Effects

1.3.7 Having identified the landscape receptors and character areas, their capacity and sensitivity to change has been considered in order to predict the nature and significance of the impacts of the proposed development (Table 4).

Table 4: Landscape Sensitivity Criteria

Criteria	Definition
Low	A landscape capable of accommodating considerable proposed change without significant effects on landscape character, features or elements.
Moderate	A landscape capable of accepting limited proposed change with some effects on landscape character, features or elements.
High	A landscape particularly sensitive to the proposed change, which would result in significant effects on landscape character, features or elements.

Source: Modification of criteria contained in the *Guidelines for Landscape and Visual Impact Assessment* (2002)

1.3.8 The criteria developed for the assessment of landscape impact significance is set out in Table 5. These criteria represent the combination of landscape quality, scale of change and landscape capacity described above:

Table 5: Landscape Impact Significance Criteria

Landscape Impact	Definition
Major adverse (negative effect)	Where the proposed changes cannot be fully mitigated; Would be completely out of scale and uncharacteristic and would substantially damage the integrity of a valued and high quality landscape, landscape features, elements and /or their setting.
Moderate adverse (negative effect)	Where the proposed changes can only be partially mitigated; Would be uncharacteristic, out of scale, and would damage a valued aspect of the landscape, landscape features or elements.
Minor adverse (negative effect)	Where the proposed changes are not completely mitigated; Where some elements of the proposed changes would be a little out of scale or uncharacteristic of an area which is not a designated landscape or not sensitive to change.
Negligible	Would complement the scale, landform and pattern of the landscape; Where some elements would result in a slight variance with the character of the area which is not a designated landscape or not sensitive to change.
Neutral	Where the proposals would be in keeping with the character of the area and/or would maintain the existing quality, or where on balance the proposals with proposed mitigation would maintain quality (where on balance the adverse effects of the proposals are off-set by beneficial effects).
Minor beneficial (positive effect)	Where the proposed changes would maintain and enhance the character and quality of the existing landscape; Enable some sense of place and scale to be restored through well-designed planting and mitigation measures.
Moderate beneficial (positive effect)	Where the proposed changes would fit in well with the existing character; Would improve the character and quality of the landscape, restoring landscape features and characteristics partially lost or damaged; Enable a sense of place, scale and quality to be restored or enhanced to a landscape of recognised quality or value through beneficial and sensitive landscape design.
Major beneficial (positive effect)	Where the proposed changes would not only fit in well with the existing character of the surrounding landscape, but would greatly improve the quality of the resource through the removal of detracting features.

Source: Modification of criteria contained in the *Guidelines for Landscape and Visual Impact Assessment* (2002)

Visual Effects

1.3.9 Visual effects are considered for the worst-case scenario on a winter's day for the construction and operational phases. The proposed development is located adjacent to Cwm Road along the Aldermaston site's northern boundary. The proposed landscape scheme may have localised landscape benefits however the scale of the planting would not alter the visual effects as there are few local views outside the Aldermaston site where the planting could be appreciated.

1.3.10 The assessment of visual effect is undertaken from identified receptors and takes into account the following:

- Sensitivity of the views and viewers (visual receptor) affected;
- The scale of the change and duration (ie. whether temporary or permanent);
- Degree of visual intrusion or obstruction that would occur; and

- Change in character or quality of the views compared to the existing views.

1.3.11 The assessment of the significance of visual impacts considers the sensitivity of visual receptors to the proposed change and the magnitude of the visual impact of the re-development. The assessment of magnitude is based upon consideration of the nature and scale of the change in view, its duration and the distance of the visual receptors concerned. The definitions in Table 6 are used to determine the significance of the visual impacts of the proposed re-development.

Table 6: Visual Impact Significance Criteria

Effect	Magnitude
Severe adverse	Where the proposed changes would form the dominant feature to which other elements become subordinate, markedly affecting and substantially changing the overall character of the scene in valued views.
Major adverse	Where the proposed changes would form a major and immediately apparent part of the scene that affects and changes its overall character.
Moderate adverse	Where the proposed changes to views would form a visible and recognisable new element within the scene and may be readily noticed by the viewer.
Minor adverse	Where the proposed changes to the views would be a minor component of the wider view and may be missed by the casual observer.
Negligible	Where the proposed change would be imperceptible or would be in keeping with and would maintain the existing views. The balance of the proposals with proposed mitigation would maintain the quality of the views.
No change	Where none of the proposed changes would be discernible.
Minor beneficial	Where the proposed change to the existing view would not only be in keeping with, but would slightly improve the quality of the existing view.
Moderate beneficial	Where the proposed changes to the existing views would be in keeping with, and would improve, the quality of the existing view.
Major beneficial	Where the proposed changes to the existing views would be in keeping with, and would greatly improve the quality of the scene through the removal of visually distracting features.

Source: Modification of criteria contained in the *Guidelines for Landscape and Visual Impact Assessment* (2002)

1.3.12 The assessment of significance requires considerable judgement in balancing the complex relationships between the different components of the landscape or views in question.

Significance of Effects

1.3.13 For the purposes of the assessment, impacts assessed as being either moderately adverse or beneficial or above are considered to be significant in terms of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999. Although minor to neutral impacts are not considered significant, they remain worthy of consideration throughout the decision making process and are therefore also noted.