



**PAGERPOWER**

# Aviation Safeguarding Report

Prepared for:

**WYG**

**Eco Site, Parley**

August, 2016



## ADMINISTRATION PAGE

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## **EXECUTIVE SUMMARY**

### **Report Overview**

Pager Power has been retained to undertake an Aviation Safeguarding Assessment for the proposed Energy from Waste (EfW) site at Chapel Lane, Parley, Christchurch in the south of England.

### **Development Overview**

The development will consist of a building with a height of 25-30m above ground level (agl) (defined as the EfW building) and a stack of height 40m agl.

### **Report Objective**

Manchester Airport Group (MAG), who safeguard Bournemouth Airport on its behalf, have requested further information with respect to the possible safety implications to the airport and its operations. This report has been produced in response to the airport's requests.

### **Results Overview**

An overview of the analysis results presented in this report is presented below:

- The results of the Obstruction Assessment showed that the EfW building would not infringe upon the Protected Surfaces around Bournemouth Airport at a maximum height of 30m agl. No impact is expected;
- The stack, measuring 40m agl, would infringe upon the Inner Horizontal Surface by 1.6m. Further consultation is advised;
- Based on a review of the LOS chart, the identified screening area and street view imagery, it would be expected that screening (in the form of woodland and buildings on the airfield) would be sufficient to screen the majority of the main EfW building (measuring up to 30m) however a stack of 40m would be expected to be visible from the ATC Tower;
- No significant impact upon aviation activity at Bournemouth Airport is expected due to the glare from the proposed EfW development;
- The proposed EfW development will be using communications infrastructure already present at the ecosite. There is expected to be no significant increase in impact due to the presence of the proposed EfW site. No impact is therefore expected;
- The proposed EfW building will be of similar height to those already present around Bournemouth Airport and therefore no significant interference would be expected due to the building as an obstruction to aviation communications;
- The proposed stack however, at its maximum height of 40m agl, may be considered an obstruction to aviation communications depending on its final dimensions, width and the communication infrastructure present on or near to Bournemouth Airport. Further consultation should be considered.

### **Recommendations**

Further consultation with MAG and/or Bournemouth Airport is advised to discuss the proposed stack regarding results of the Obstruction Assessment. Further consultation should be considered regarding the stack as a possible interference mechanism for aviation communications systems.

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## 1 BACKGROUND

### 1.1 Project Introduction

Pager Power has been retained to undertake an Aviation Safeguarding Assessment for the proposed Energy from Waste (EfW) site at Chapel Lane, Parley, Christchurch in the south of England.

Manchester Airport Group (MAG) who safeguard Bournemouth Airport on its behalf, have requested further information with respect to the possible safety implications to the airport and its operations. Therefore this report has been produced in response to the airport's requests and specifically the analysis includes:

- Executive summary, contents and introduction;
- Development overview;
- Summary of consultation response;
- Overview of assessed infrastructure including:
  - Obstacle Limitation Surfaces;
  - Air Traffic Control operations including consideration of glare;
  - Air Traffic Engineering including radio communications.
- Physical safeguarding assessment based on obstacle limitation surfaces;
- High-level assessment of ATC operations and radio communications;
- Summary of findings;
- Conclusions and recommendations.



## 2 DEVELOPMENT OVERVIEW

### 2.1 Project Plans

The development will consist of a building with a height of 25-30m above ground level (agl) (defined as the EfW building) and a stack of height 40m agl. Figure 1<sup>1</sup> below shows the overall site development plans.



Figure 1 *Comprehensive development proposed site plan*

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Figure 2<sup>2</sup> below shows the location of the proposed EfW building and stack.

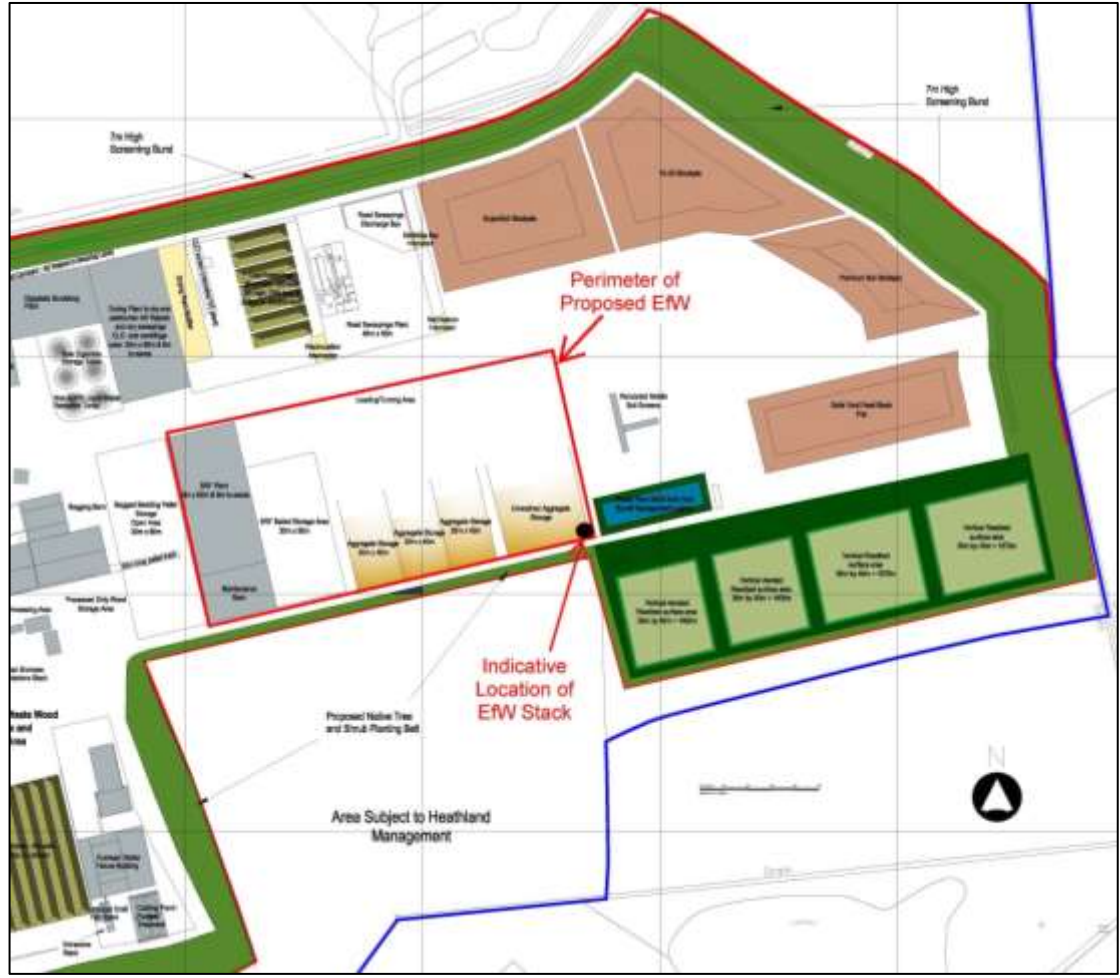


Figure 2 Approved site plan illustrating perimeter of EfW Building and Stack

<sup>2</sup> Source: Source: © Alliance Planning. © Reproduced from Sitemap DXF Data PDB 12 by permission of Ordnance Survey® on behalf of the Controller of Her Majesty's Stationary Office. © Crown Copyright 2010. All rights reserved.



Figure 3<sup>3</sup> below shows the location of the proposed EfW building (blue boundary) and stack<sup>4</sup> overlaid on an aerial image.



Figure 3 Approved site plan illustrating perimeter of EfW Building and Stack – aerial image

<sup>3</sup> Source: © 2016 Google.

<sup>4</sup> Note: The stack location and height is subject to change. The highest possible stack height has been considered in this assessment.

Figure 4<sup>5</sup> below shows the location of the proposed EfW building and stack relative to Bournemouth Airport.

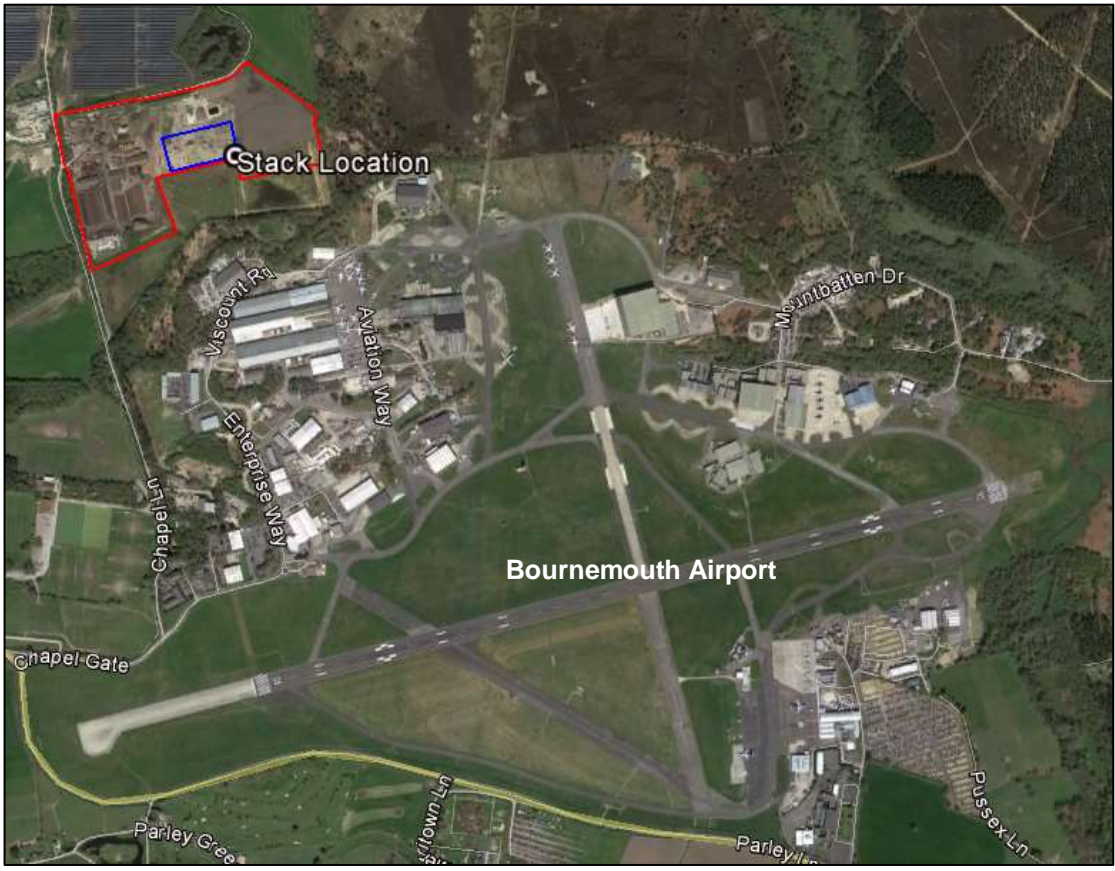


Figure 4 Approved site plan illustrating perimeter of EfW Building and Stack – aerial image

<sup>5</sup> Source: © 2016 Google.

### 3 SUMMARY OF CONSULTATION RESPONSE

Manchester Airport Group was consulted on behalf of Bournemouth Airport with respect to the proposed an Energy from Waste (EfW) Facility. The response was received 27th July 2016 and key points are presented below with respect to the Aviation safeguarding Report (key points are underlined). The full consultation response is presented in Appendix A.

#### *2.0 Draft Waste Plan Update – Additional and Emerging Preferred Sites*

*2.1 In respect of the additional sites proposed we are surprised that the consideration on the safeguarding implications for BOH has not appeared to be a consideration in any of the site assessments. To be clear the aforementioned Circular requires Local Planning Authorities to have regard to inter alia the following aerodrome safeguarding criteria when bring forward proposals:*

- i. Bird-strike Risk. The handling and processing on non-inert waste has the potential of attracting increased bird activity. Any assessment of such sites should include a bird-strike risk assessment and mitigation plan. It should be stated that sometimes proposals result in risks that cannot be overcome. In such circumstances an objection would be sustained and if any consent were to be granted with such an outstanding objection (or without recommended conditions) then the safety regulator (in the case of BOH this is the Civil Aviation Authority) and the consultee must be informed. The safety regulator may then request the First Secretary of State to call in the application for determination. **Not assessed in this report.***
- ii. Obstacle Limitation Surfaces. Within 15km of an airport there are a series of protected surfaces that restrict any upstanding non-frangible obstacles of a certain height. This applies to temporary structures such as cranes and excavators as well as permanent structures.*
- iii. Air Traffic Control. All proposals for lighting in both construction or operational phase (or other potential sources of glare) should be examined to ensure there is no impact on the sightlines from Air Traffic Control or aircraft operating from or in the vicinity of the airport.*
- iv. Air Traffic Engineering. Details of any radio communications systems operating in the vicinity of the airport should be detailed and assessed to ensure there is no interference with on-airport critical equipment or communication frequencies.*

*This advice applies to all sites emerging through the Waste Local Plan.*

Key points from the consultation response are as follows:

- An assessment of the Obstacle Limitation Surfaces (OLS) is required for both permanent and temporary structures;
- An assessment of the effects of glare from lit and non-lit surfaces is required. This includes aircraft operating in the vicinity of the airport;
- An assessment of proposed radio communications systems in relation to aviation communications infrastructure is required.

## 4 ASSESSMENT OVERVIEW AND RESULTS

### 4.1 Obstacle Limitation Surfaces

Obstacle Limitation Surfaces are used by civil and military aviation authorities worldwide to determine whether tall structures will affect local airports and airbases. They are imaginary surfaces constructed around an airport in order to safeguard aircraft from other structures in the surrounding environment.

In the UK, the guidance that defines the surfaces is taken from CAP 168 (Licensing of Aerodromes) which is derived from International Civil Aviation Organisation (ICAO) rules.

The details for the assessed EfW building and stack are presented in Table 1 below.

ID	Location	Ground level <sup>6</sup>	Height agl <sup>7</sup>	Overall maximum height amsl <sup>8</sup>
EfW building	Within the blue line boundary <sup>9</sup>	16m	30m	46m
Stack	Latitude = 50.789819° Longitude = -1.852750°	16m	40m	56m

Table 1 Assessed EfW building and stack location and height details

The results of the Obstacle Limitation Assessment are presented in Figure 5 on the following page.

<sup>6</sup> Based on OS Panorama 50m DTM.

<sup>7</sup> Above ground level

<sup>8</sup> Above mean sea level

<sup>9</sup> Assessed as the same location as the stack for assessment purposes and closest location to Bournemouth Airport.

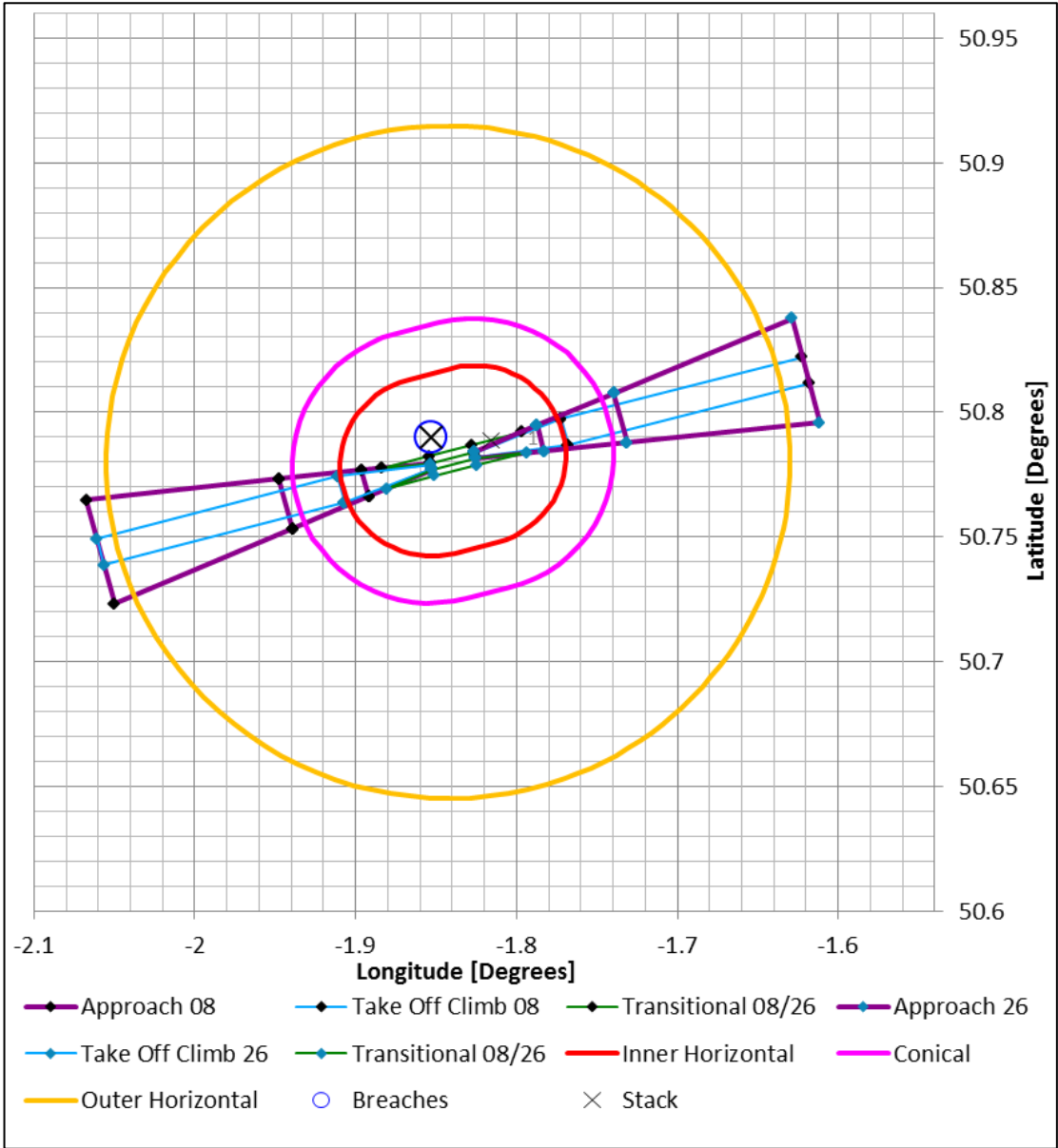


Figure 5 *Obstacle Limitation Surfaces chart*

Table 2 shows the overall results of the assessment.

ID	Result	Surface	Vertical Clearance	Other affected surfaces
EfW building	Clear	-	+8.4m	-
Stack	Breach	Inner Horizontal Surface	-1.6m	None

Table 2 *Obstacle Limitation Surfaces assessment results*



#### 4.1.1 Assessment Results Discussion

The results of the Obstacle Limitation assessment have shown that the proposed EfW building is clear of infringement upon the Protected Surfaces by 8.4m and no impact is expected. However, a stack measuring 40m agl would infringe upon the Inner Horizontal Surface by 1.6m. This means that the maximum height of a stack that would not infringe upon the Inner Horizontal Surface at the proposed location would be 38.4m agl.

Further accuracy could be added by completing a survey of the land height. Currently, the results show that a stack of 40m in height may receive an objection from Bournemouth Airport because it could be considered a risk to safety.

If the proposed height or a revised height were to be accepted, it is expected that aviation lighting would be required. The associated Textual Data and Charts would need to be updated so that the stack was clearly marked.

Note: an infringement of an Obstacle Limitation Surfaces does not necessary mean that a development will be not acceptable with regard to safety. The ATC Tower at Heathrow Airport significantly breaches the Inner Horizontal Surface, as shown in Figure 6<sup>10</sup> below.



Figure 6 Heathrow Airport ATC Tower

#### 4.1.2 Further Comment

It is also likely that any temporary tall structure would need to be lit with aviation lighting. Bournemouth Airport should be consulted with respect to any proposed crane activity, for example.

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<sup>10</sup> Source: "New Heathrow ATC tower" by JamesZ\_Flickr / CC BY-SA 2.0 / Via Flickr / Resized from original.



#### 4.2 Air Traffic Control Operations including Consideration of Glare

The ATC Tower is approximately 1.7km south east of the proposed EfW site. Their respective locations are shown in Figure 7<sup>11</sup> below.



Figure 7 ATC tower location and EfW site location

Figure 8<sup>12</sup> on the following page shows a zoomed in aerial image of the ATC Tower.

<sup>11</sup> Source: © 2016 Google.

<sup>12</sup> Source: © Bing Maps, © 2016 Blom and © 2016 Microsoft Corporation.



Figure 8 ATC Tower location- zoomed

The co-ordinates of the ATC Tower have been extrapolated using aerial imagery and the ground elevation and tower height have been taken from Airport’s Textual Data. The details are presented in the table below.

Latitude (°)	Longitude (°)	Ground Height	ATC Tower Height	Overall Assessed Height
50.779254	-1.835719	10m	13.7m	23.7m

Table 3 ATC tower details

A line of sight (LOS) calculation and area assessment has been undertaken to determine the visibility of the EfW site to personnel with the ATC Tower.

The area assessment (not presented here) revealed that, based on bare earth terrain, the proposed site would be visible to a viewer in the ATC Tower down to 5m agl or less and therefore the proposed EfW site would significantly visible. A LOS calculation was then completed to determine whether intervening screening would be likely to remove the site from view. The LOS chart is presented in Figure 9 on the following page.

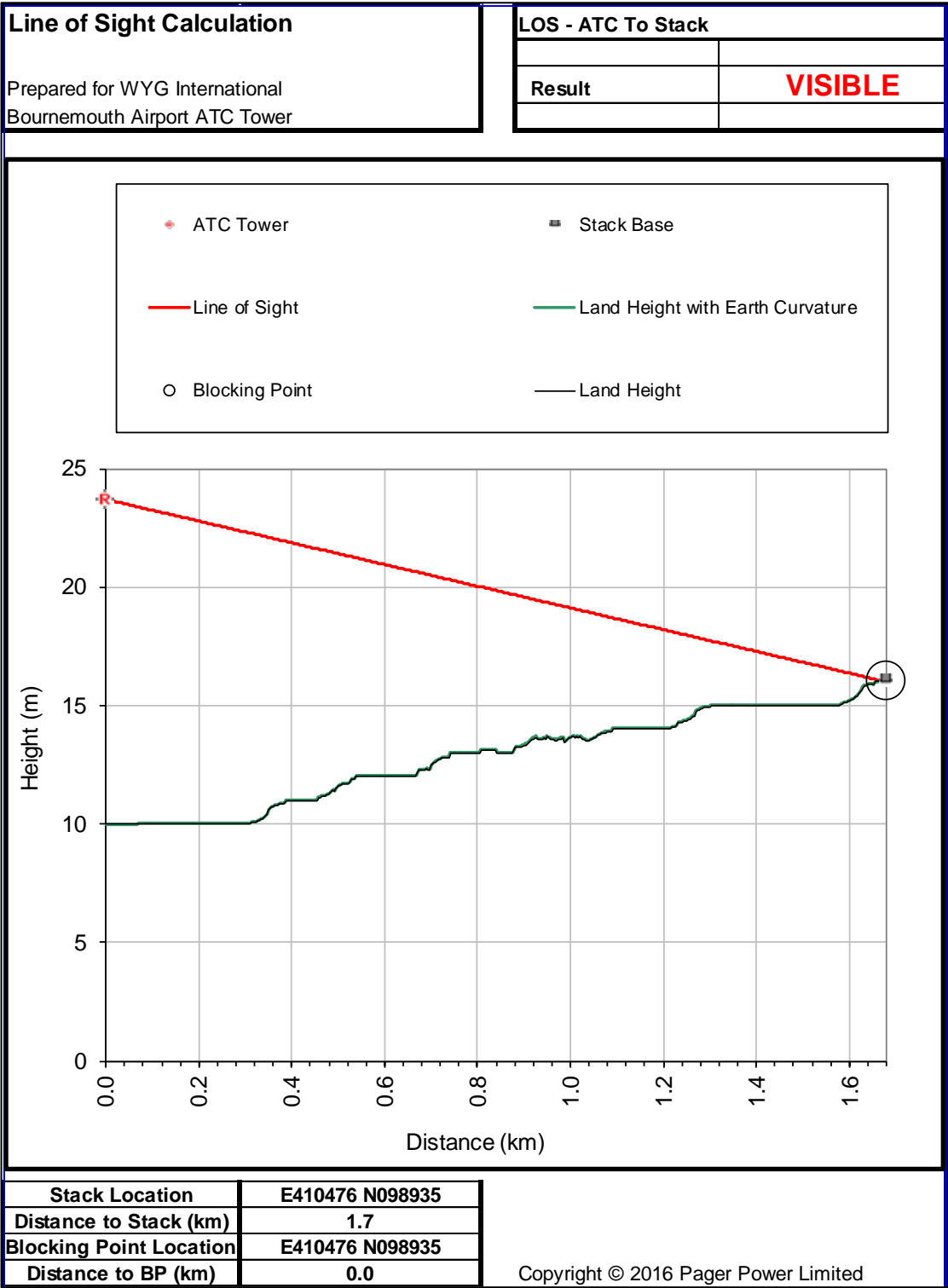


Figure 9 ATC Tower to base of stack on the proposed EfW site

The LOS chart shows that the terrain slopes upwards from the ATC Tower to the base of the proposed stack on the EfW site. An investigation to determine whether there is any intervening screening has been undertaken by reviewing the appropriate aerial and street view imagery. Figure 10 on the following page shows the identified screening.

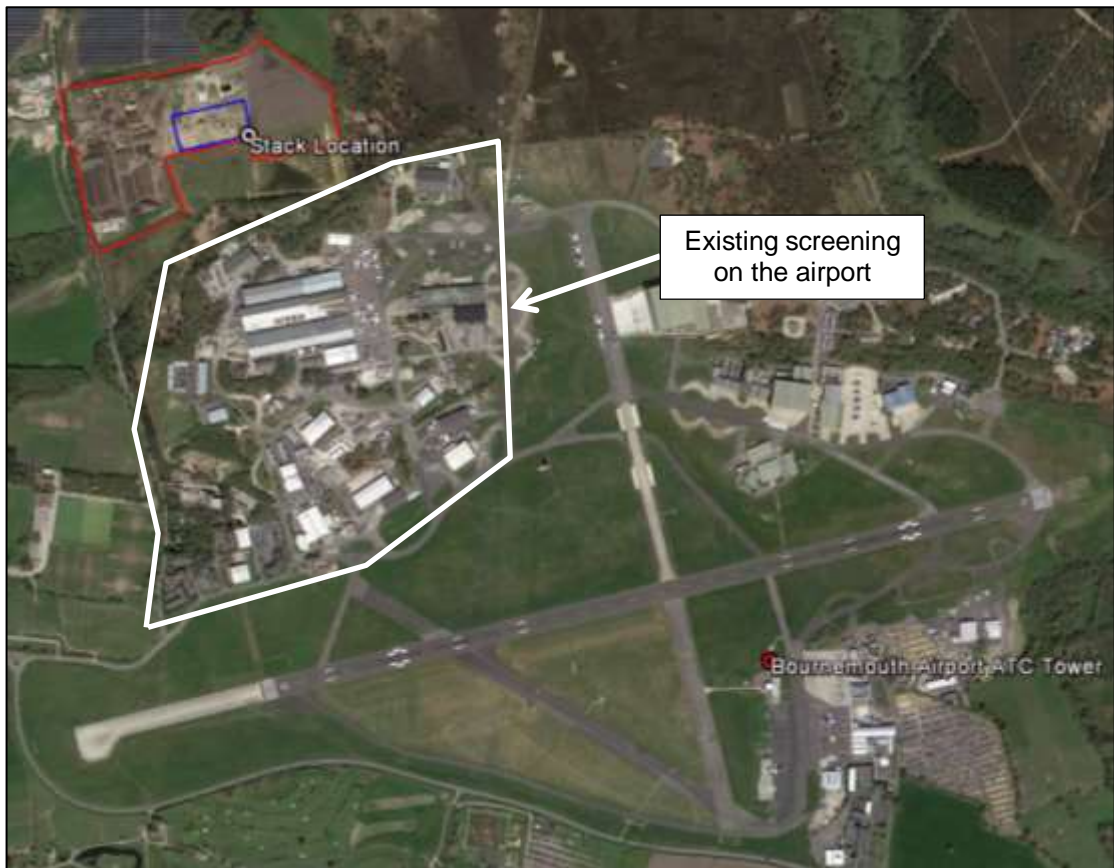


Figure 10 Identification of existing screening between the ATC Tower and the EfW site

Based on a review of the LOS chart, the identified screening area and street view imagery, it would be expected that the screening (in the form of woodland and buildings on the airfield) would be sufficient to screen the majority of main EfW building (measuring up to 30m) however a stack of 40m would be expected to be visible from the ATC Tower.

#### 4.2.1 Consideration of Glare

MAG, on behalf on Bournemouth Airport, requested that the impact of glare was considered. Glare may be caused by a reflective surface or via a light either towards an Air Traffic Controller or aviation activity in in the airspace above and on Bournemouth Airport.

The developer was consulted to determine what reflective surface and lights were to be used on the EfW site. It was stated that there will be no substantive sources of glare beyond windows (glass) that could create a significant detrimental impact towards Air Traffic Controllers in the ATC Tower (if indeed the EfW building is visible). In terms of lighting, there would be lights no more intense than those already present in the surrounding environment.

No significant impact upon aviation activity at Bournemouth Airport is expected due to the glare from the proposed EfW site.



### 4.3 Air Traffic Engineering including Radio Communications

Airports use wireless radio communication between a ground station and an aircraft for receiving key information. Information that may be transmitted includes location, altitude and voice data. Interference to these systems may occur via the presence of a development in the surrounding area. The two main interference categories to consider are presented below:

- Electromagnetic interference to existing signals through the presence of new signals;
- Interference to existing signals via the presence of a physical obstruction.

Each of these is discussed in the following sub-sections in context of the proposed EfW building and stack.

#### 4.3.1 Electromagnetic Interference

Electromagnetic interference to communications systems can occur through a number of mechanisms, these include:

- Two conflicting transmitting devices;
- Passive or unwanted electromagnetic emissions from one device to another;
- Metallic structures.

The proposed EfW development will be using communications infrastructure already present at the ecosite. There is expected to be no significant increase in impact due to the presence of the proposed EfW site. No impact is therefore expected.

#### 4.3.2 Physical Obstruction Interference

Physical obstructions can cause interference to communications mechanisms through two main mechanisms, these are described below.

- Diffraction – When an obstacle physically blocks a radio signal, the field strength in the shadow of the obstacle is weaker than in front of it. This is known as diffraction. Diffraction also occurs when an obstacle is close to the radio path even if it does not obstruct it.
- Reflection – Obstacles can also reflect a radio signal in an unwanted direction. This can mean that the transmitted signal is received at a different location or a different time than it would have been. This, in turn, can lead receiving equipment to display incorrect information.

The proposed EfW building will be of similar height to those already present around Bournemouth Airport and therefore no significant interference would be expected due to the building as an obstruction to aviation communications. The proposed stack however, at its maximum height of 40m agl, may be considered an obstruction to aviation communications depending on final dimensions and the communication infrastructure present on or near to Bournemouth Airport.

Further consultation with MAG and/or Bournemouth Airport should be considered.

## 5 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Results Overview

An overview of the analysis results presented in this report is presented below:

- The results of the Obstruction Assessment showed that the EfW building would not infringe upon the Protected Surfaces around Bournemouth Airport at a maximum height of 30m agl. No impact is expected;
- The stack, measuring 40m agl, would infringe upon the Inner Horizontal Surface by 1.6m. Further consultation is advised;
- Based on a review of the LOS chart, the identified screening area and street view imagery, it would be expected that screening (in the form of woodland and buildings on the airfield) would be sufficient to screen the majority of the main EfW building (measuring up to 30m) however a stack of 40m would be expected to be visible from the ATC Tower;
- No significant impact upon aviation activity at Bournemouth Airport is expected due to the glare from the proposed EfW development;
- The proposed EfW development will be using communications infrastructure already present at the ecosite. There is expected to be no significant increase in impact due to the presence of the proposed EfW site. No impact is therefore expected;
- The proposed EfW building will be of similar height to those already present around Bournemouth Airport and therefore no significant interference would be expected due to the building as an obstruction to aviation communications;
- The proposed stack however, at its maximum height of 40m agl, may be considered an obstruction to aviation communications depending on its final dimensions, width and the communication infrastructure present on or near to Bournemouth Airport. Further consultation should be considered.

### Recommendations

Further consultation with MAG and/or Bournemouth Airport is advised to discuss the proposed stack regarding results of the Obstruction Assessment. Further consultation should be considered regarding the stack as a possible interference mechanism for aviation communications systems.





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